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THE FAR EASTERN REVIEW

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1918

Engineering
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遠東時報

Vol. XIV., No. 1 ❋ SHANGHAI – MANILA ❋ January, 1918

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Planting and Manufacturing Companies Formed to Sell Product Direct to Consumers of the World

New Blast Furnace at Penchihu

Second Unit of Plant Is Blown in to Bring More Prosperity to Manchuria By Turning Ore into Pig Iron

The Outdoor Staff of the Customs

Plea for Reform of the Conditions Imposed on This Underpaid and Overworked Branch of the Service

Flood Damage to the Peking-Hankow Railway

Huge Bridge Girders Washed Away by Torrential Overflow of Streams

1832

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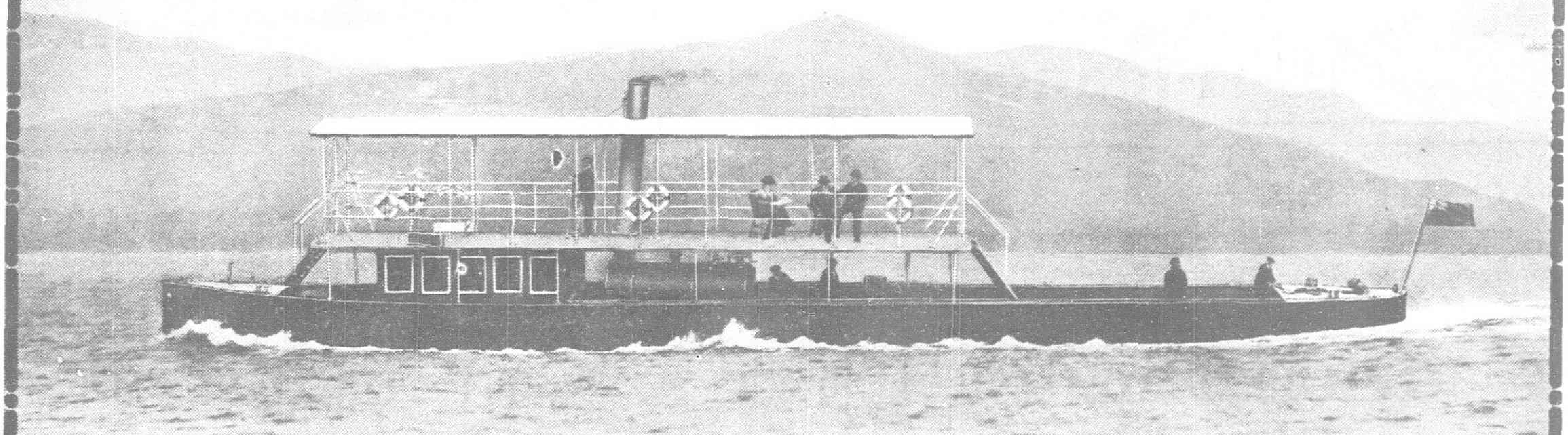

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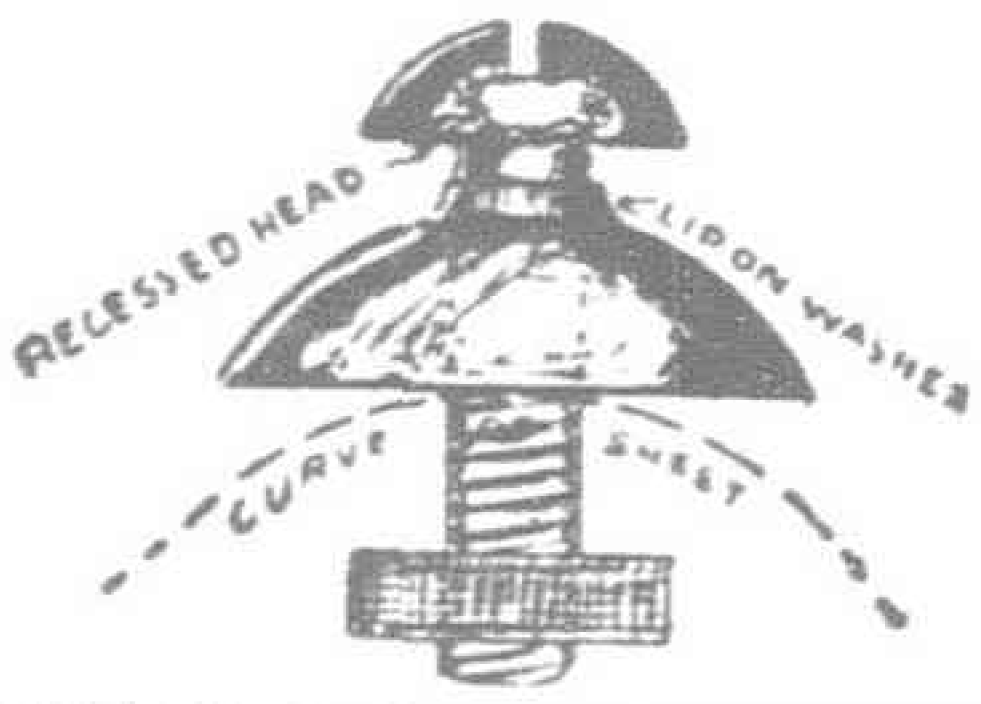

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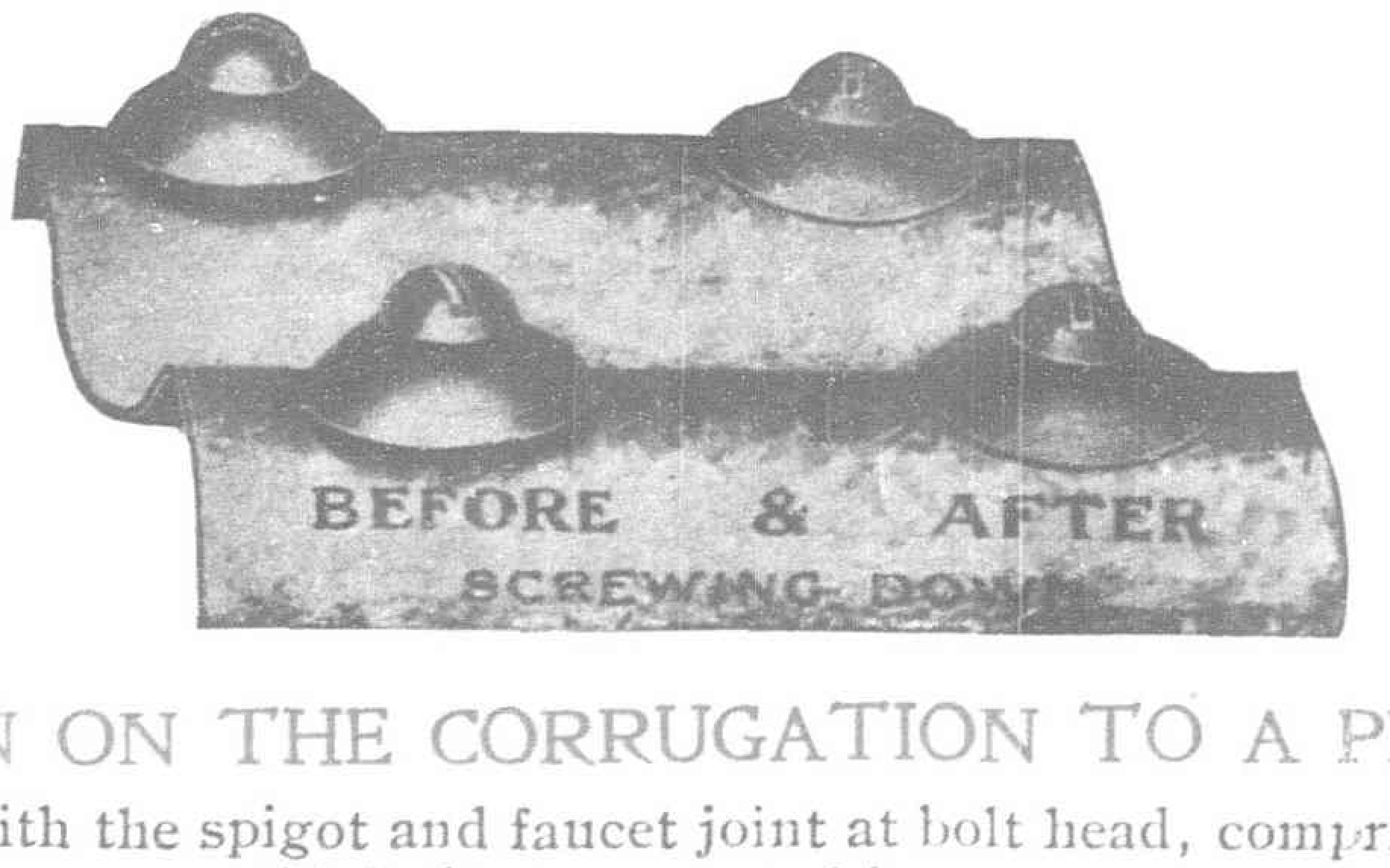

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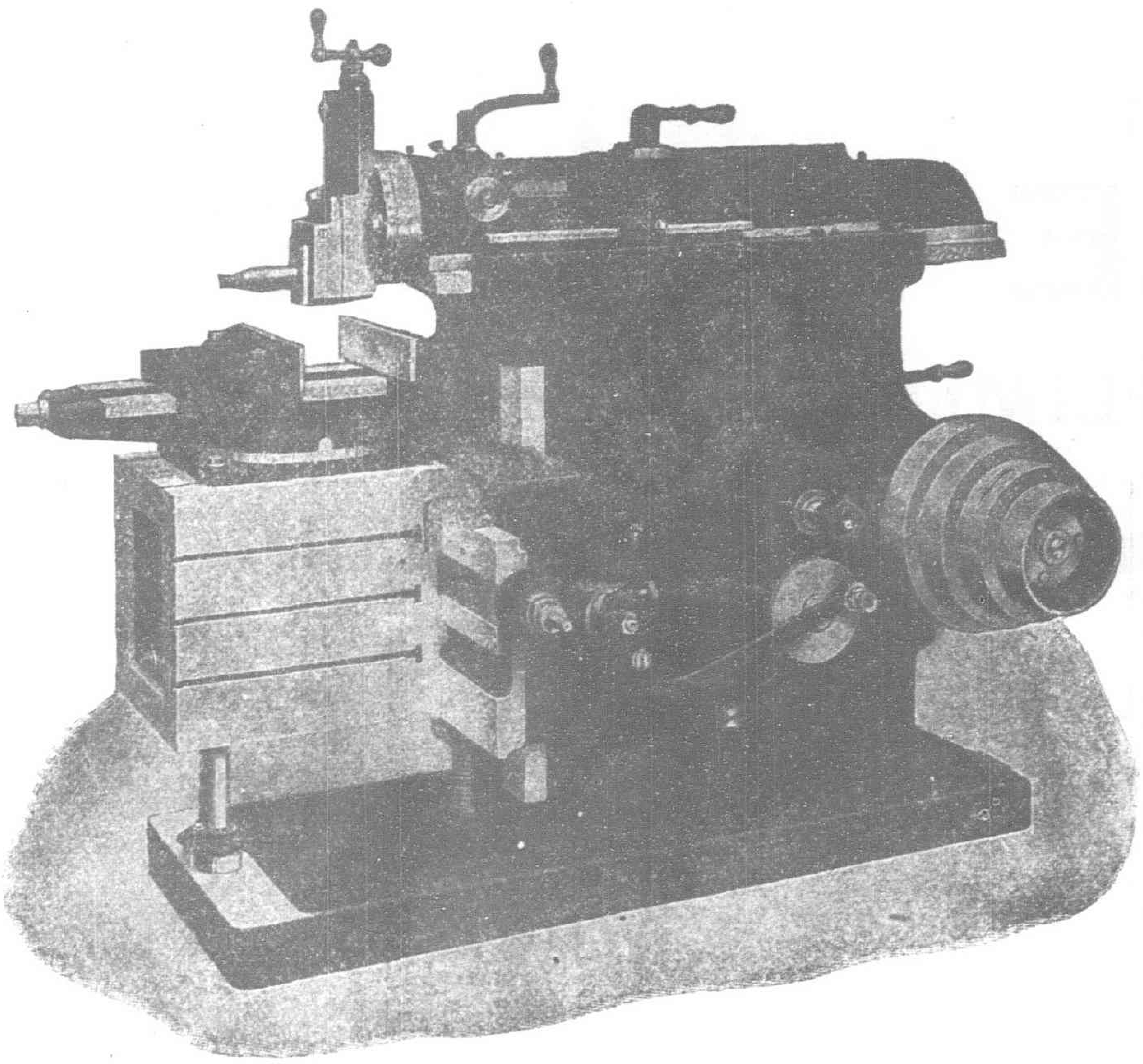

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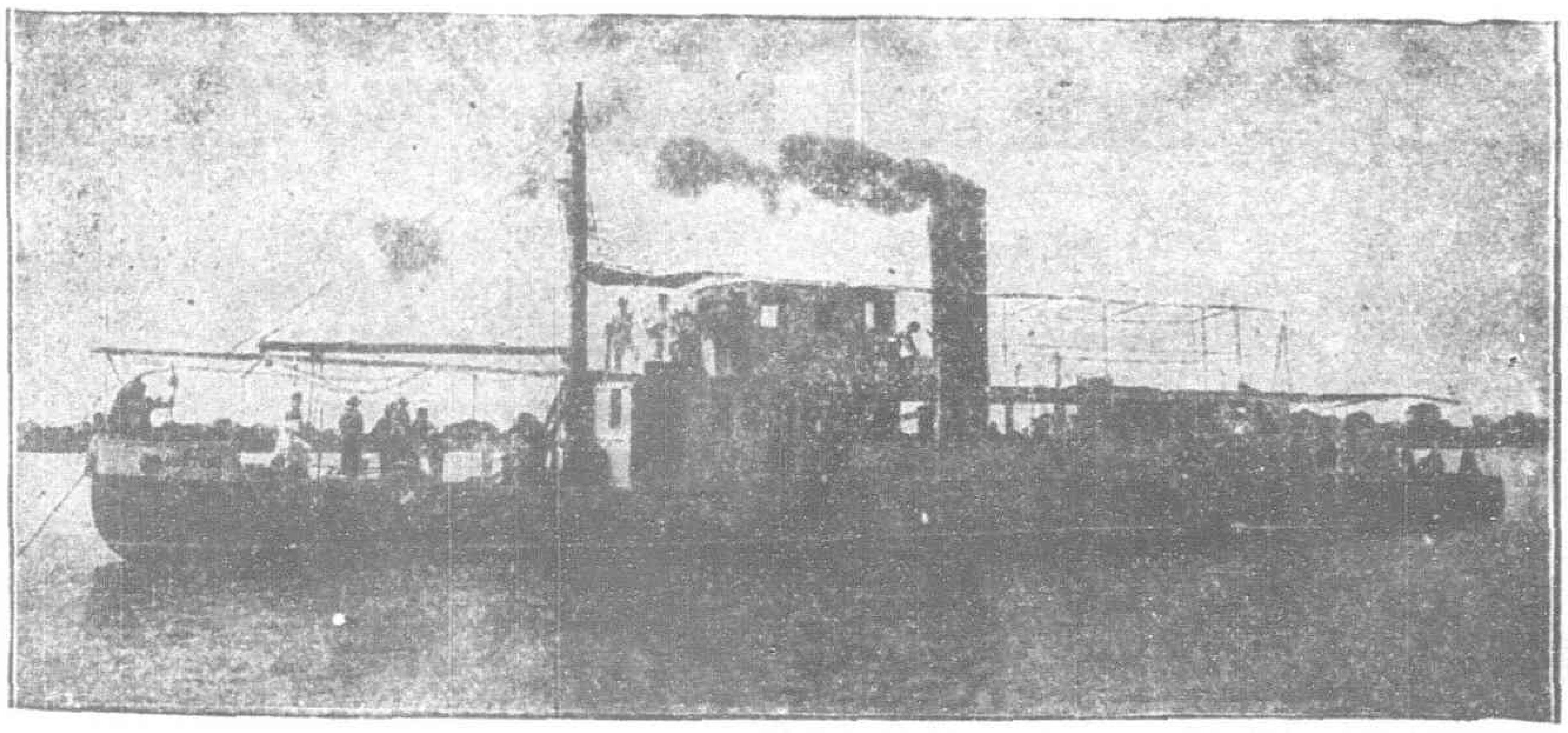

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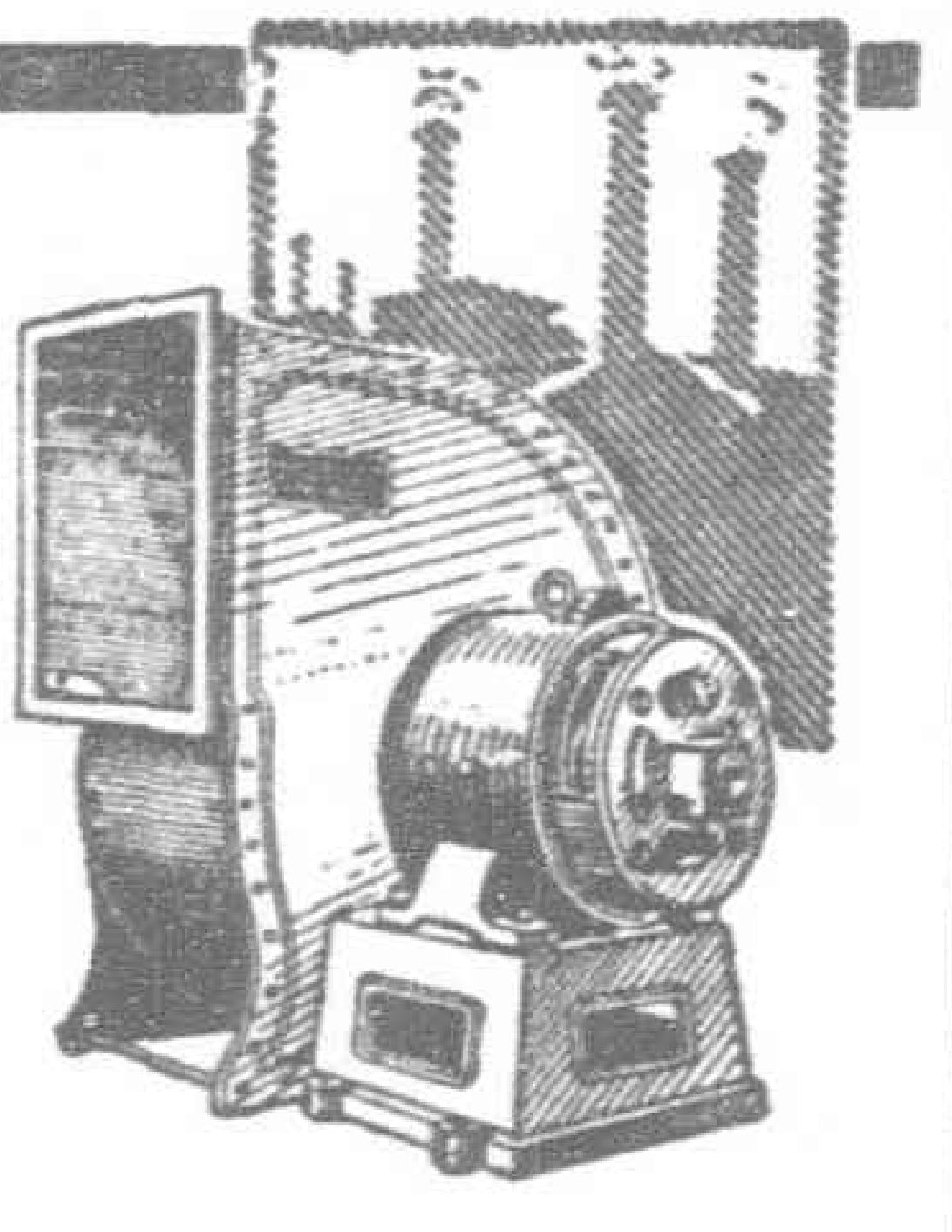

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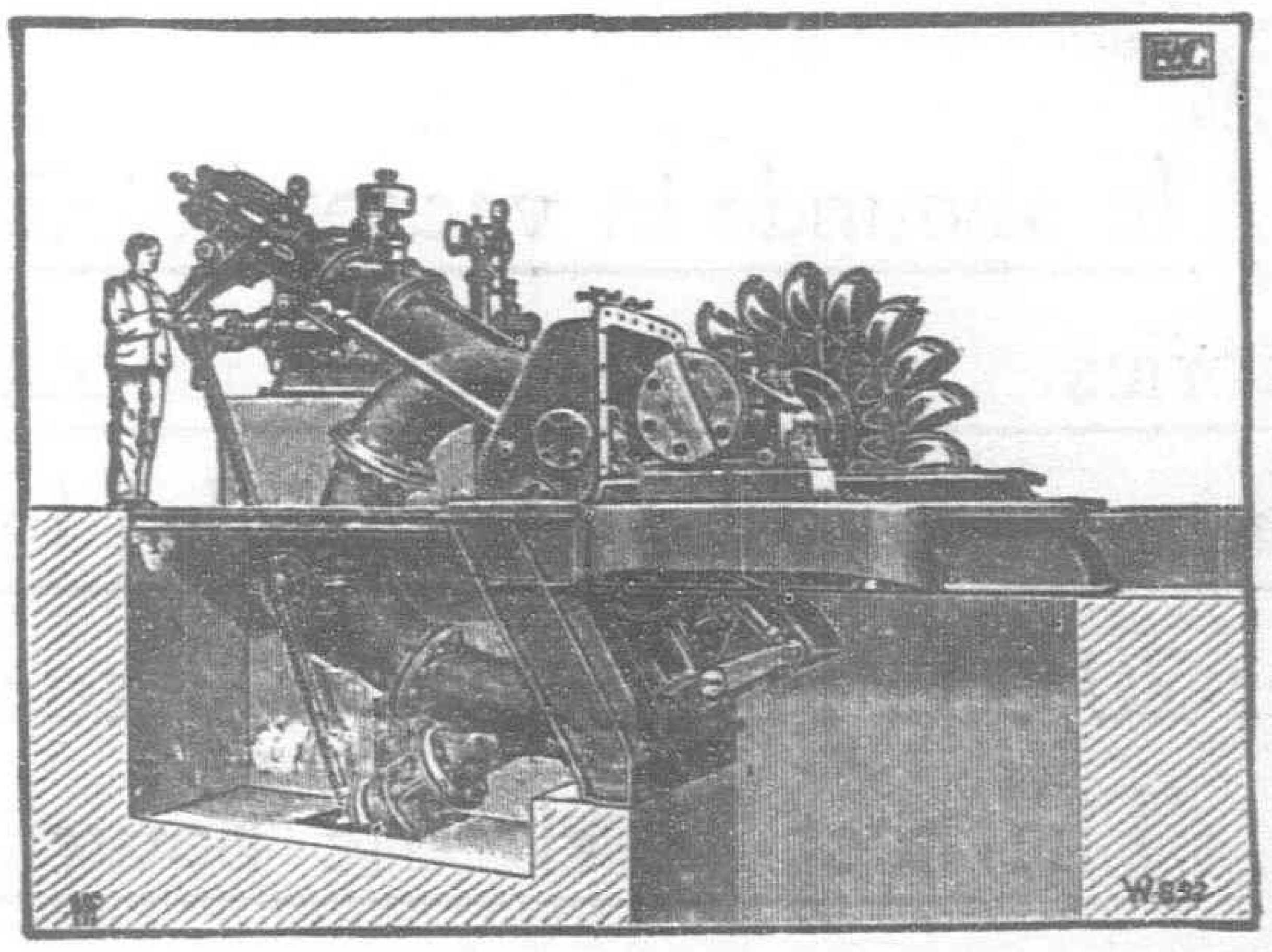

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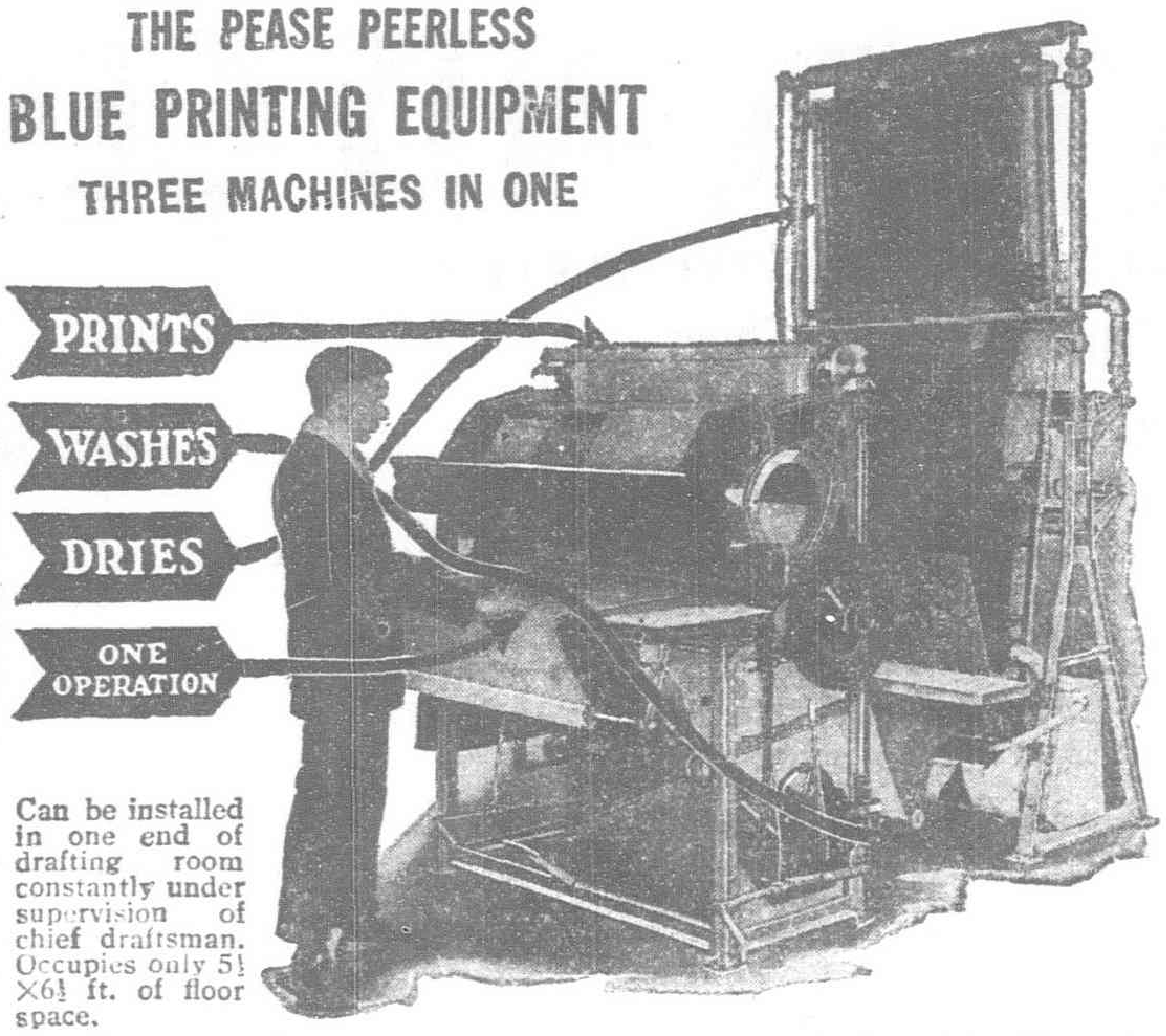

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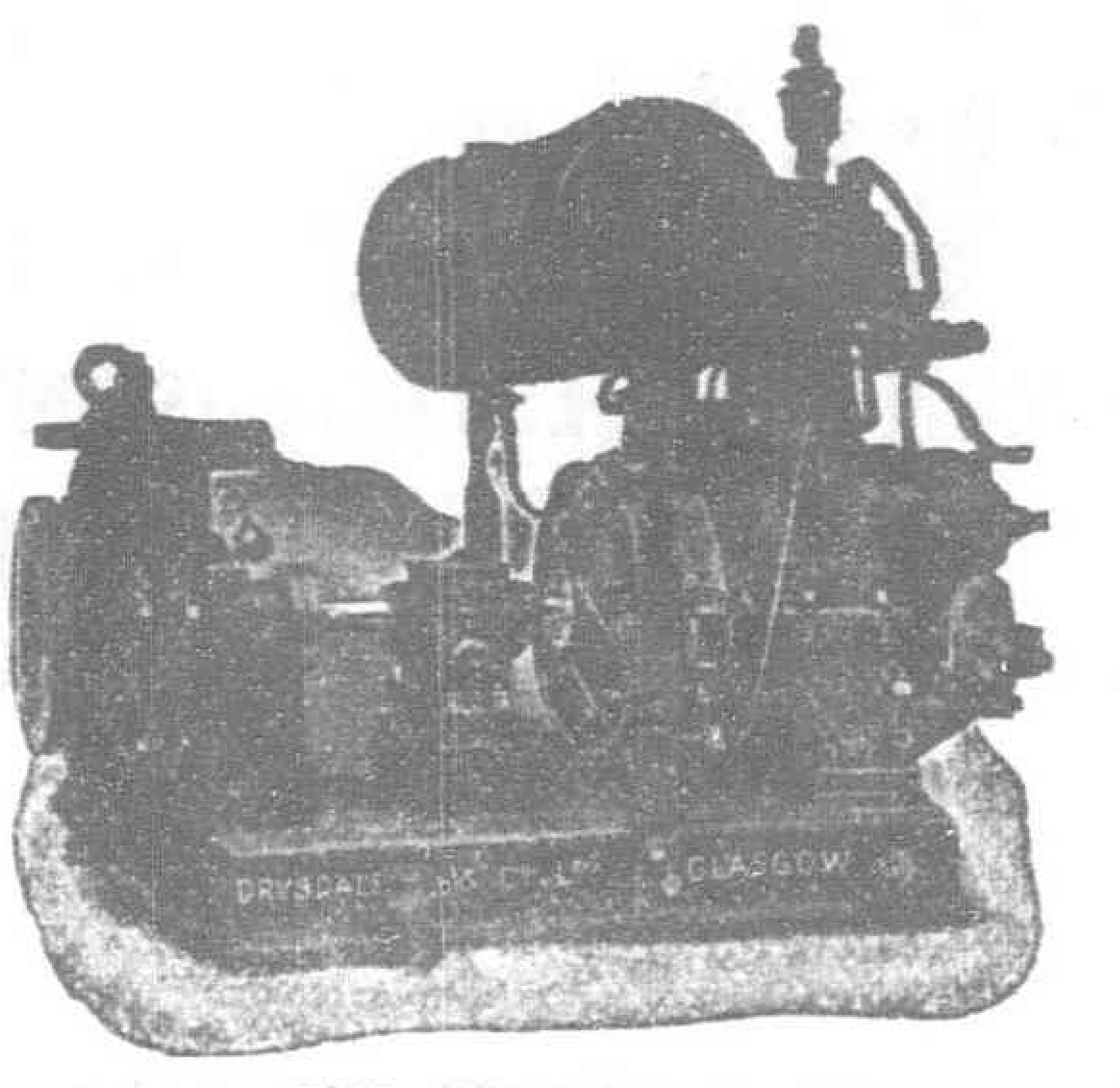

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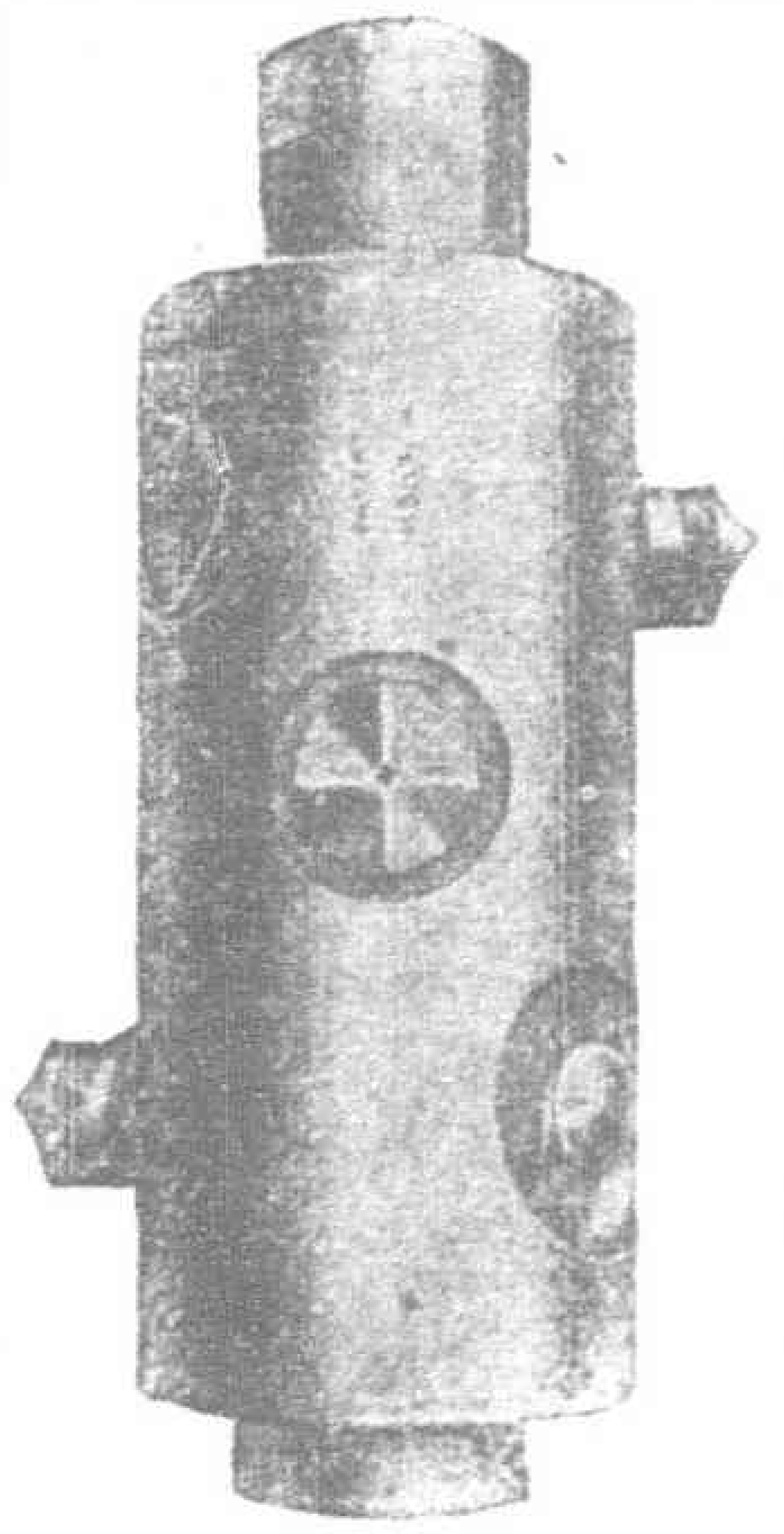

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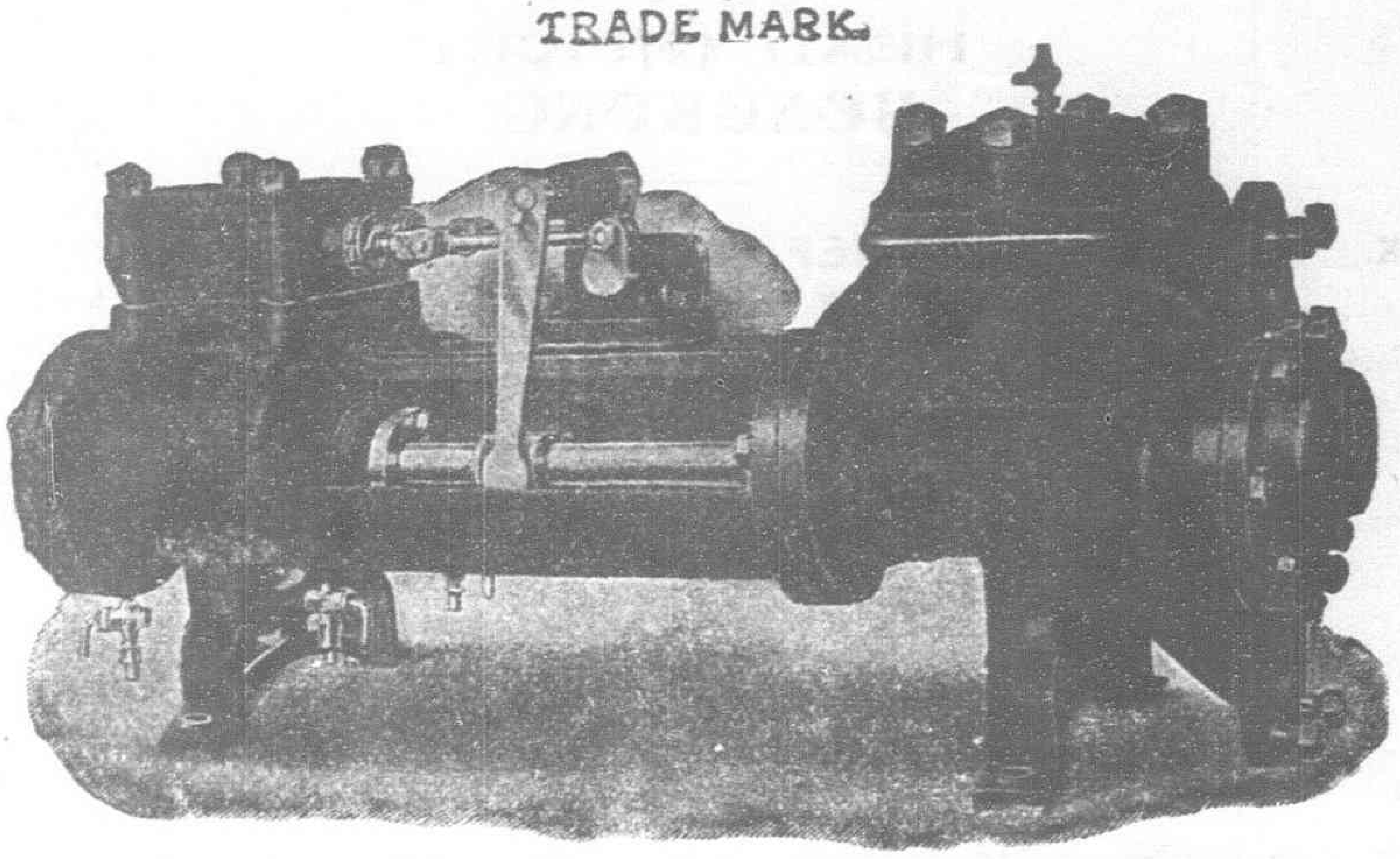

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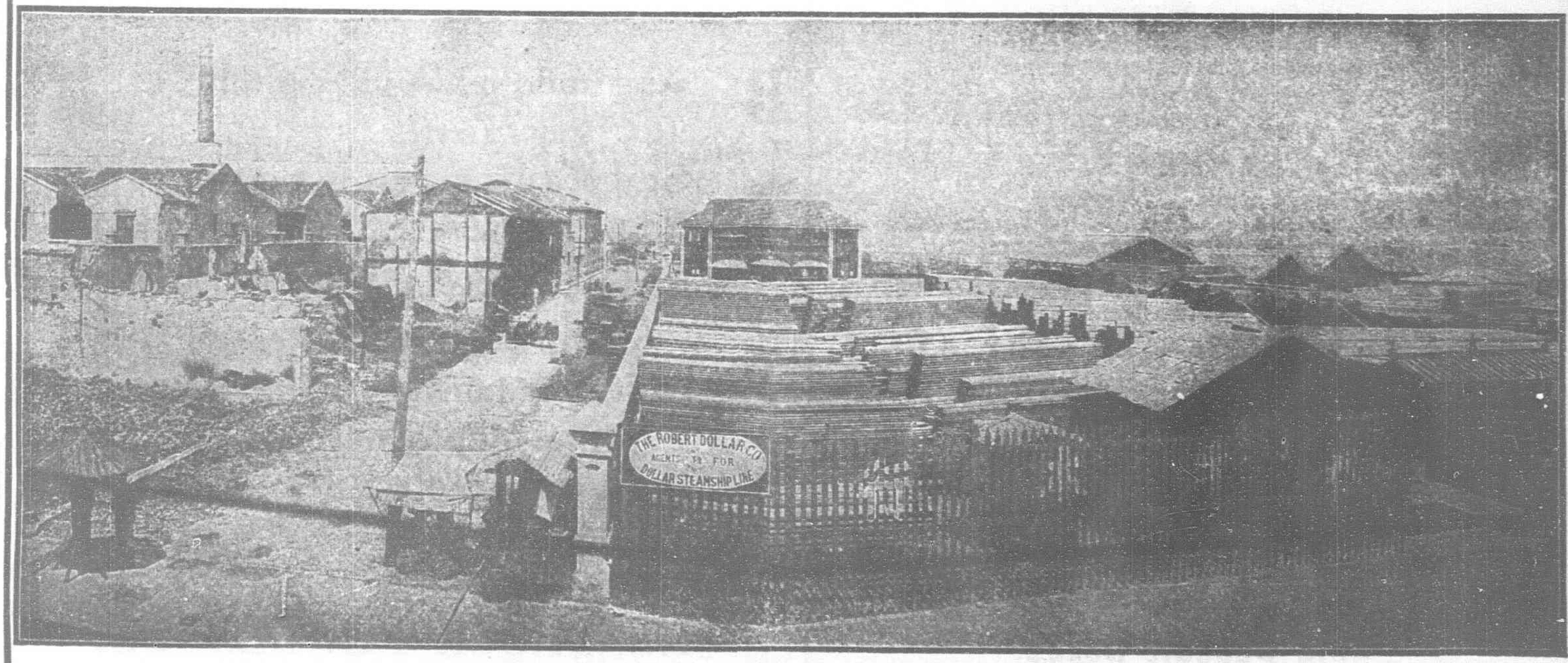

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Westinghouse Electric Export Company
Complete Electric and Steam Equipments for all Purposes
"The Name Westinghouse is a Guarantee."

W WESTINGHOUSE ELECTRIC

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IMPORTERS AND EXPORTERS
ENGINEERS AND CONTRACTORS
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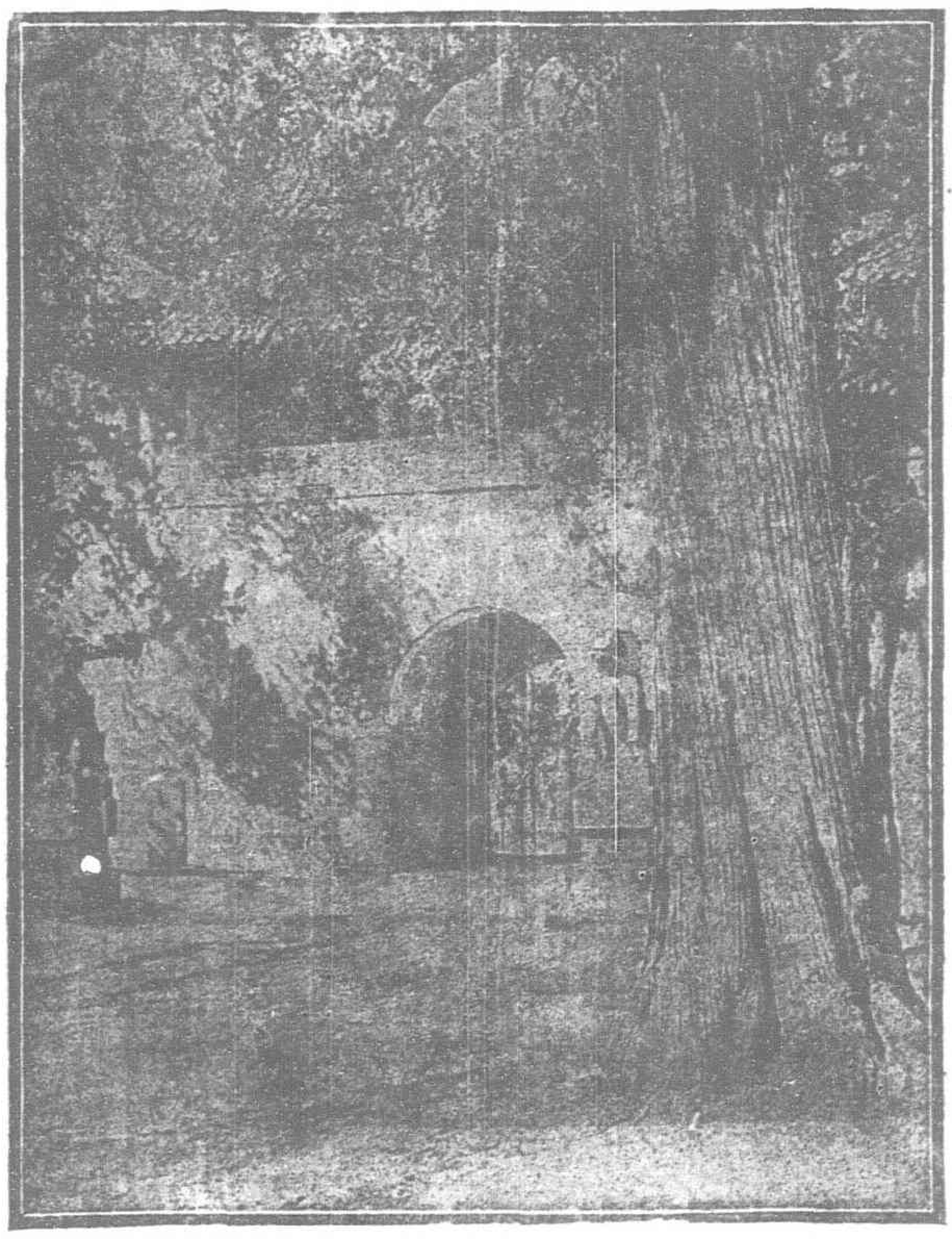
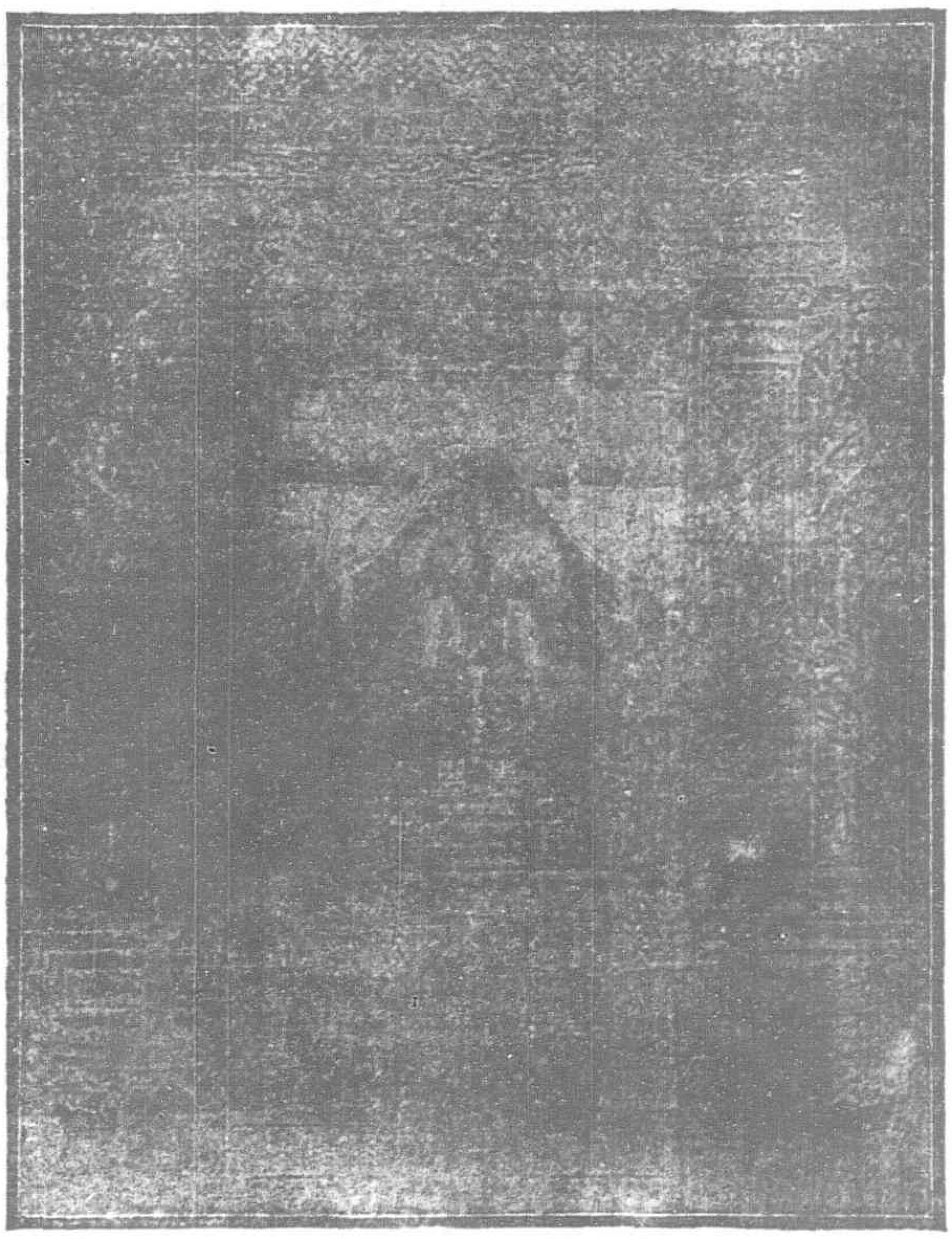
CHINESE GOVERNMENT RAILWAYS

TIENTSIN-PUKOW LINE



SECOND GATE, GRAVE YARD OF CONFUCIUS
CHU-FU, SHANTUNG



SHRINE OF CONFUCIUS
CHU-FU, SHANTUNG

Mukden-Peking-Kalgan-TIENTSIN-TSINANFU-HSUCHOWFU-PUKOW-Nanking-Shanghai.
all by rail only

Being the **quickest, surest and most convenient** connection between Shanghai on the one and Tientsin, Peking, Kalgan, Mukden and the **Siberian route on the other side,** this railway represents **a saving of many hours, of many troubles,** worries and inconveniences for the busy merchant, the home tripper on short furlough.

The tourist, the globe trotter travelling with more leisure and bent on seeing things, it takes right away from the stereotyped banality of the great ports, takes him through many provinces of the vast republic and shows him **something of the "real" China,** of its people, its history and its beauty.

Express trains equipped with sleeping and buffet cars run once a week each way between Pukow (Nanking) and Tientsin connecting with the through service of the South-Manchuria and Trans-Siberian Railways.

Through mail trains equipped with **buffet cars run daily each way** between the before mentioned termini.

The crossing over the Yangtsekiang between Nanking and Pukow is effected by means of a modern 100-tons twin-screw ferry boat.

Special facilities and **liberal allowances** for passengers' baggage.

Best of **meals and wines supplied** on the trains.

Sanitation under the personal supervision of a **qualified medical officer.**

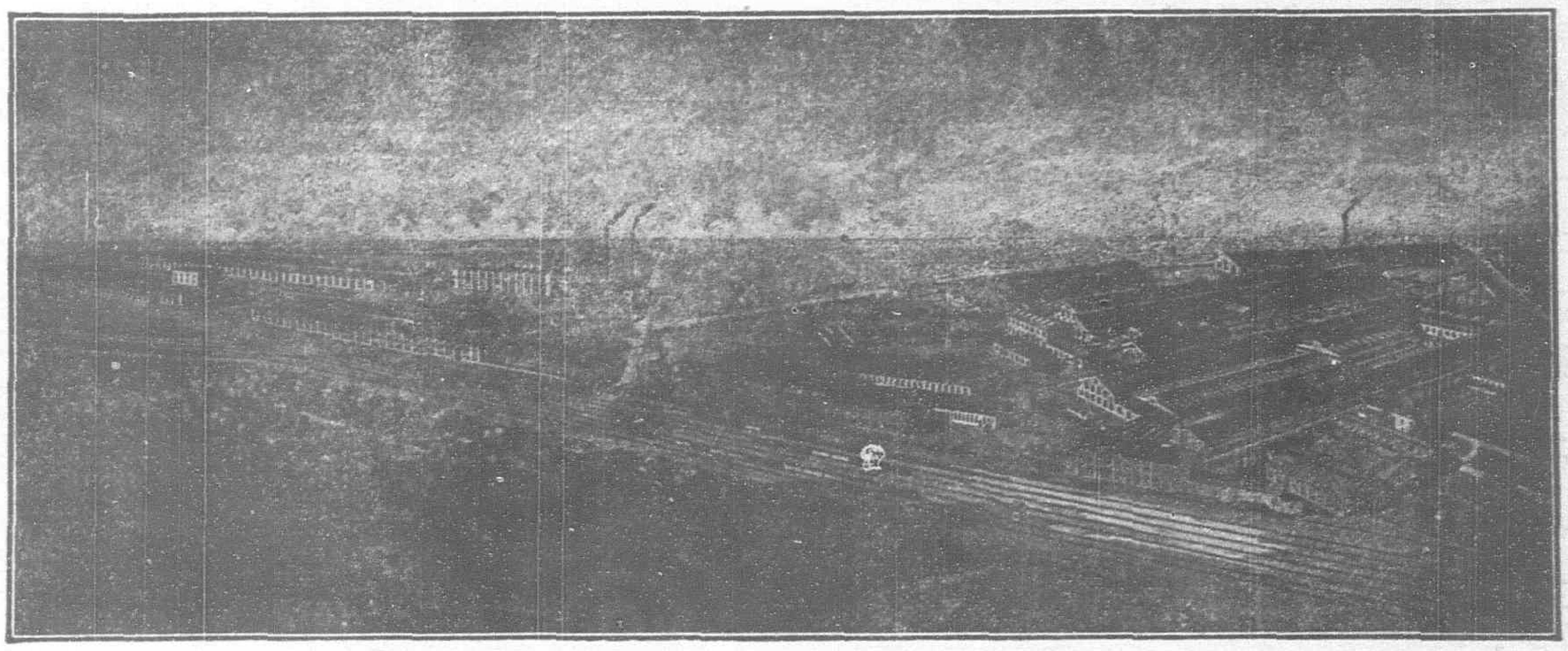
For further particulars apply to THE TRAFFIC MANAGER, Head Office, TIENTSIN, or to the Agencies of Messrs. Thomas Cook & Sons, The International Sleeping Car & Express Trains Co. or the Nordisk Resebureau.

Telegraphic Address: TSINPURY—Tientsin (Tsinanfu, Nanking, Shanghai)
Codes: A.B.C. 5th Edition; Broomhalls' (with Suppl. No. 1)

Tientsin, May 1st, 1915. **The Tientsin-Pukow Railway Administration.**

AMERICAN LOCOMOTIVE COMPANY

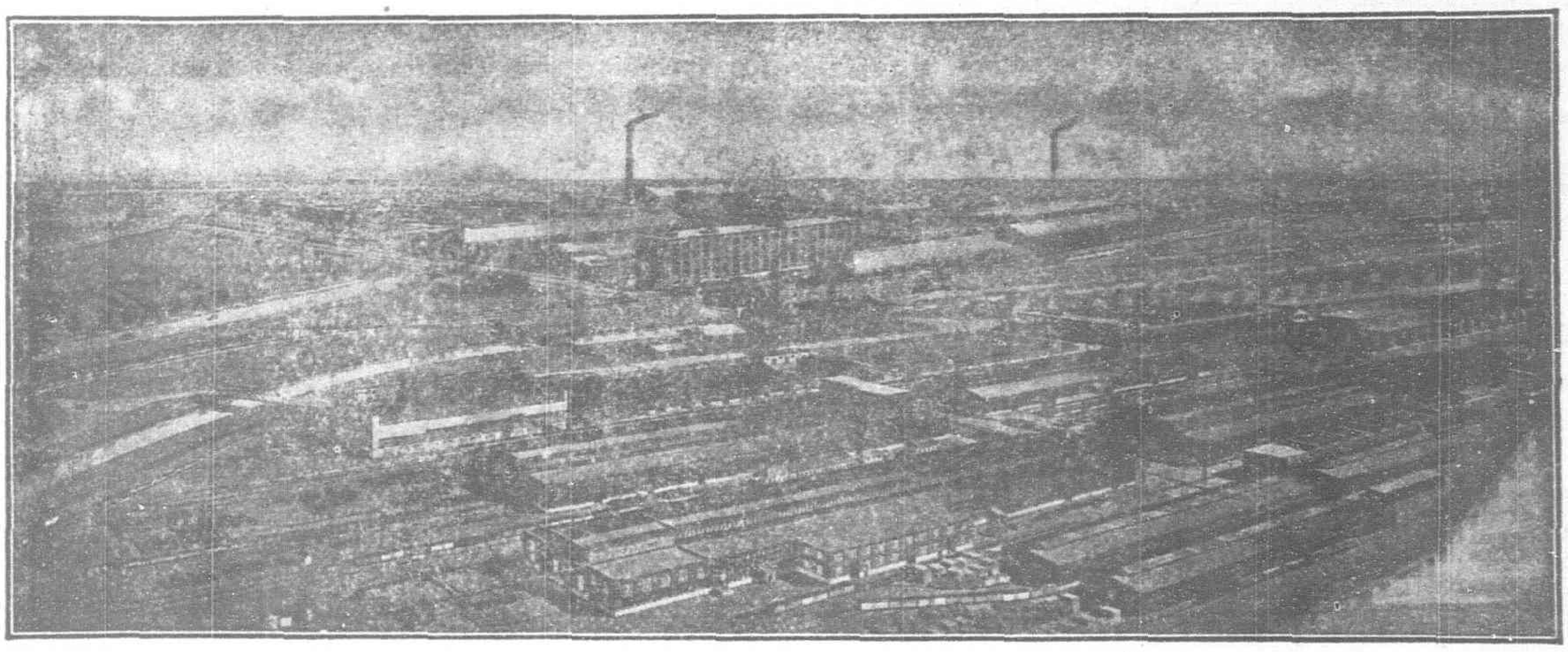
30 CHURCH STREET, NEW YORK, U. S. A.



SCHENECTADY WORKS, SCHENECTADY, NEW YORK

The experience of the American Locomotive Company in designing and building locomotives for all classes of railroad construction and operation dates back to 1835.

Its seven plants cover 356.78 acres and have a floor area of 4,038,226 square feet. When working at full capacity these plants have a combined annual output of 3,000 locomotives and employ 20,000 men.



BROOKS WORKS, DUNKIRK, NEW YORK

AMERICAN LOCOMOTIVE SALES CORPORATION

Export Representatives in all Foreign Countries, except Canada.

30 CHURCH STREET, NEW YORK, U. S. A.
CABLE ADDRESS: LOCOMOTIVE, NEWYORK

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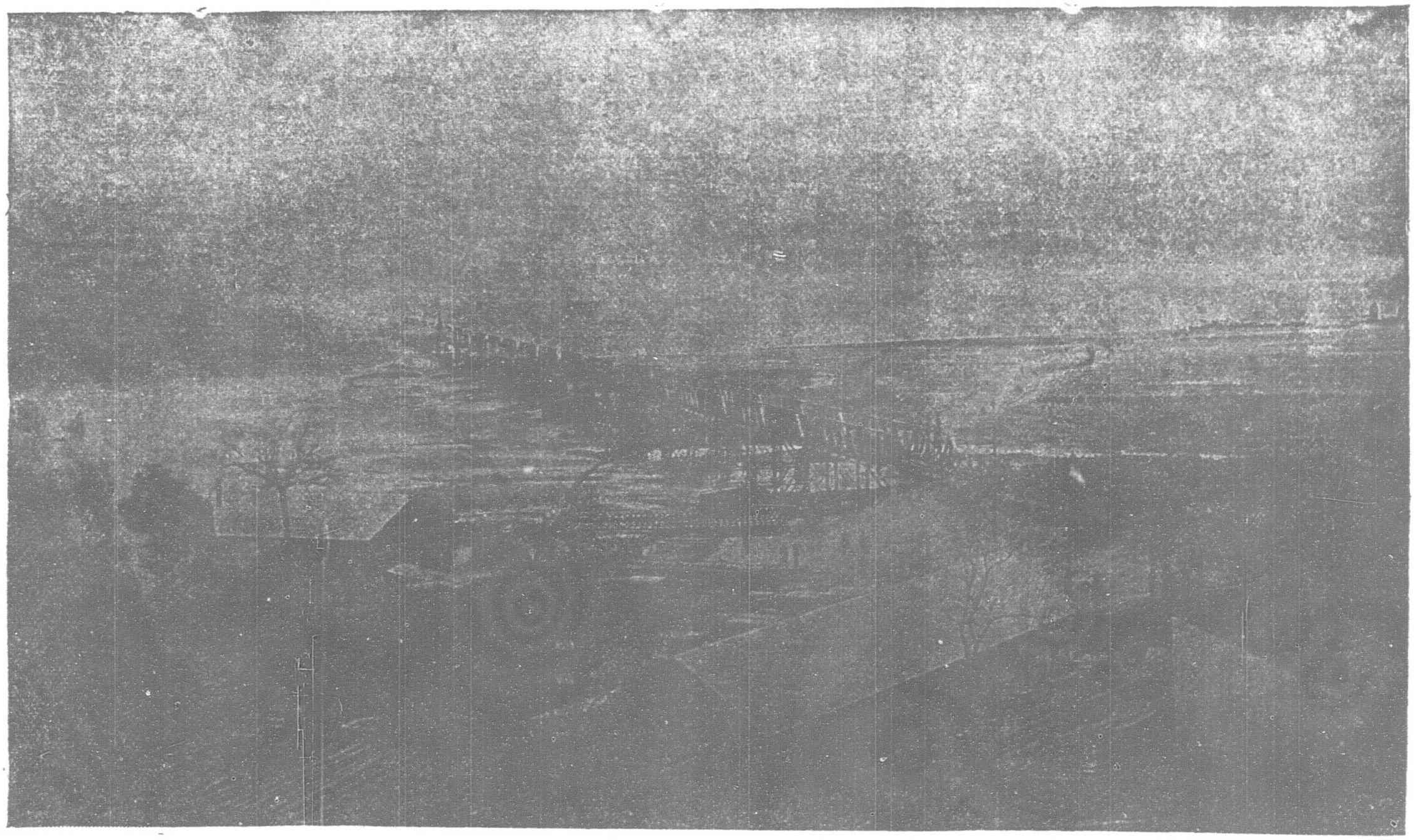
CHINA—Mitsui & Company, Mitsui Bussan Kaisha, Tientsin
JAPAN—Mitsui & Company, 1 Suruga Cho, Tokyo
RUSSIA—Russian American Trading Corporation, Nevsky 1, Petrograd



THE YELLOW RIVER BRIDGE ON THE PEKING-HANKOW LINE

CHINESE GOVERNMENT RAILWAYS

PEKING-HANKOW LINE

"THE ROAD THROUGH THE HEART OF CHINA"

Avoid the Cold and Rough Weather in the Sea Trip between Shanghai and the North by the more comfortable Route up the Yangtsze to Hankow, and from there via the Ching-Han Railway to Peking, where through connections for Europe are made with the Trains de Luxe of the Government Railways of North China.

This line passes through the Heart of the Country and enables the traveller to and from Europe to catch a glimpse of Old China. Ancient walled cities, temples and pagodas are seen from the comfortable seats of the weekly trains de luxe operated by this line. From Peking, the great capital of the oldest civilization in the world, the train departs from the famous Chien-Men and carries the traveller through the historical and legendary portions of the Country, to the modern industrial center at Hankow—the Chicago of China. Connections are made with the Cheng-Tai Railway at Chengtingfu, with the Tao-Ching Line at Sin Siang-sien, and at Chengchowfu with the Pienlo Line.

A weekly express train de luxe leaves Peking every Tuesday, and Hankow every Friday, making the trip of over 700 miles in less than thirty hours.

For information apply to any office of the International Sleeping Car Co. or Thos. Cook and Sons.

American Car & Foundry Company

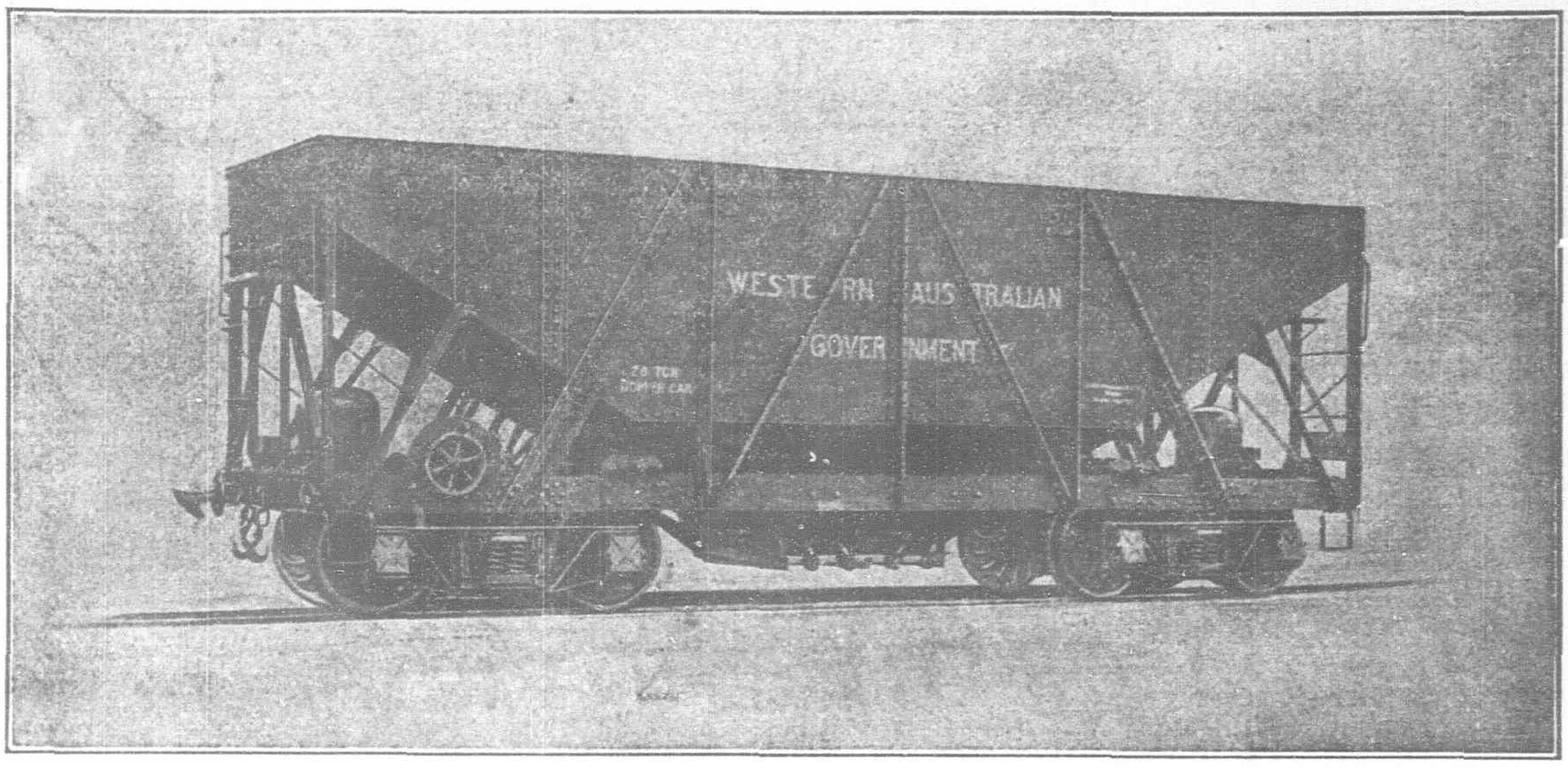
CHICAGO

GENERAL OFFICES
165 BROADWAY
NEW YORK

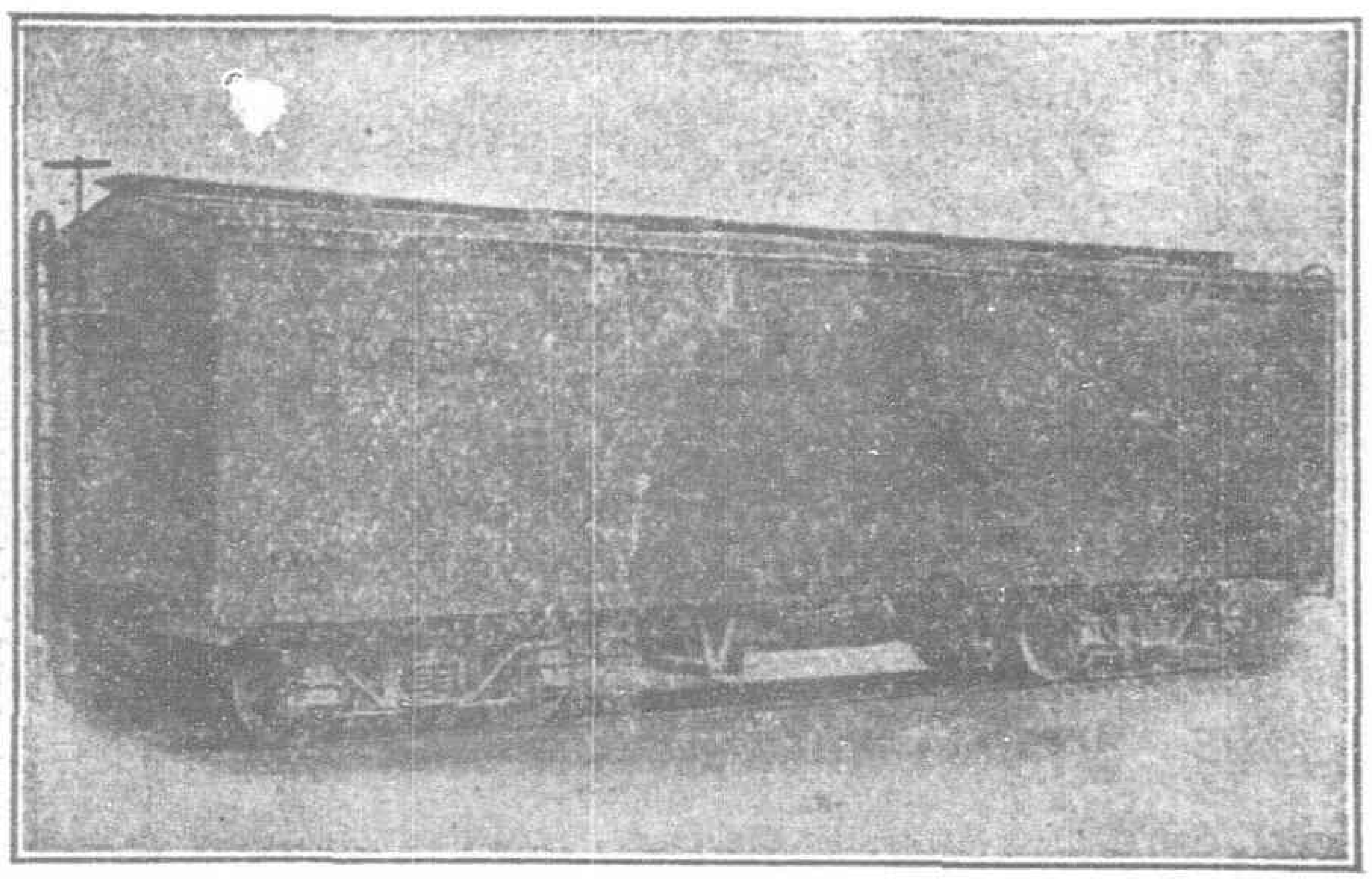
ST. LOUIS

CAR BUILDERS

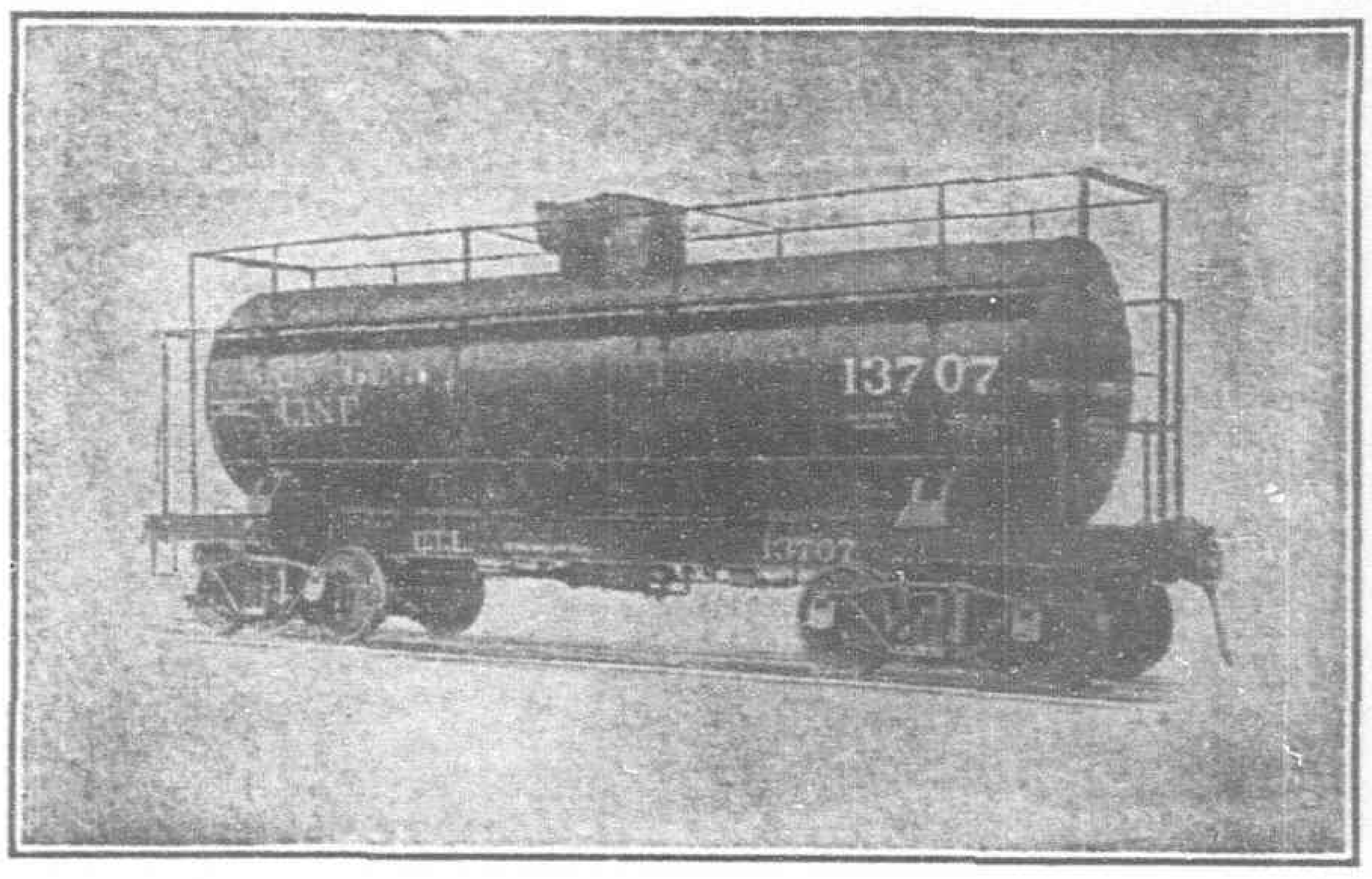
OUTPUT	150,000	FREIGHT CARS	PER ANNUM
	1,500	PASSENGER CARS	
	2,000,000	CAR WHEELS	



ALL STEEL HOPPER CAR FOR AUSTRALIAN GOVERNMENT
Gauge 3'-6" (1,066 M.) Length 26'-5" (8.051 M.) Capacity 52,000 lbs. (23.600 K.) or 900 Cubic Feet (25.47 Cu. M.)
Net Weight 26,000, lbs. (11,800 K.)



FOR ARGENTINE REPUBLIC
Gauge 3'-3⅜" (1,000 M.) Length 30'-0" (9.144 M.) Capacity 50,000 lbs. (22,700 K.) Weight 24,300 lbs. (11,000 K.)



AMERICAN TYPE TANK CAR
Capacity 8,000 Gals. (30,300 Liters.) Weight 36,800 lbs. (16.700 Kilos)

Export Representative

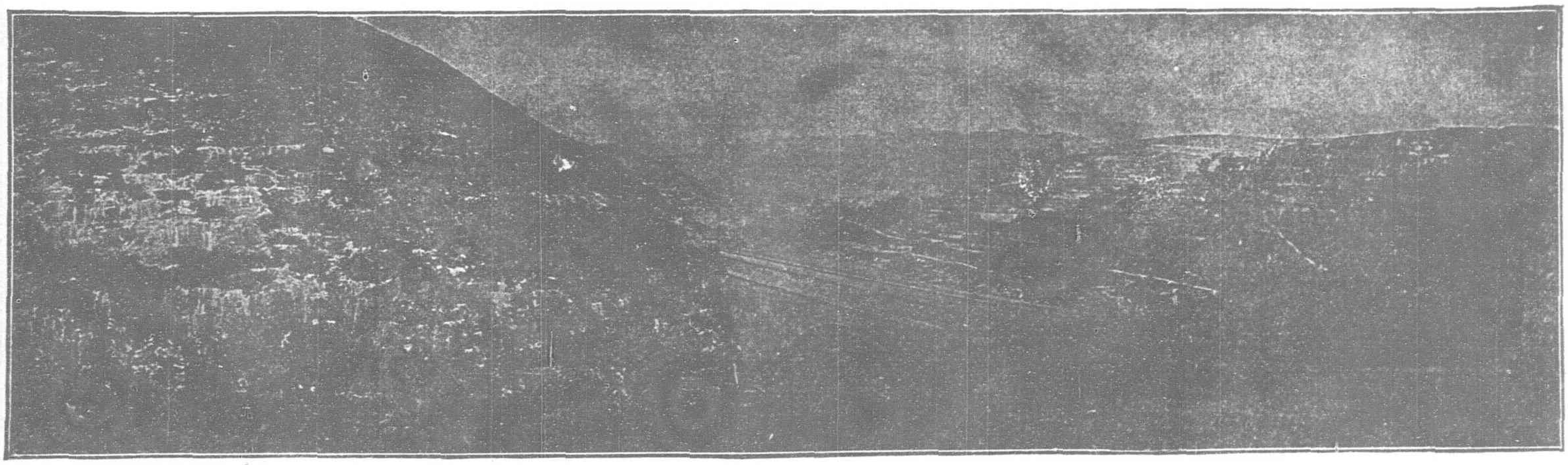
American Car and Foundry Export Company

165 BROADWAY NEW YORK

Chinese Government Railways

The Cheng-Tai Railway

(CHINESE GOVERNMENT SHANSI LINE—CHENGTINGFU TO TAIYUANFU).

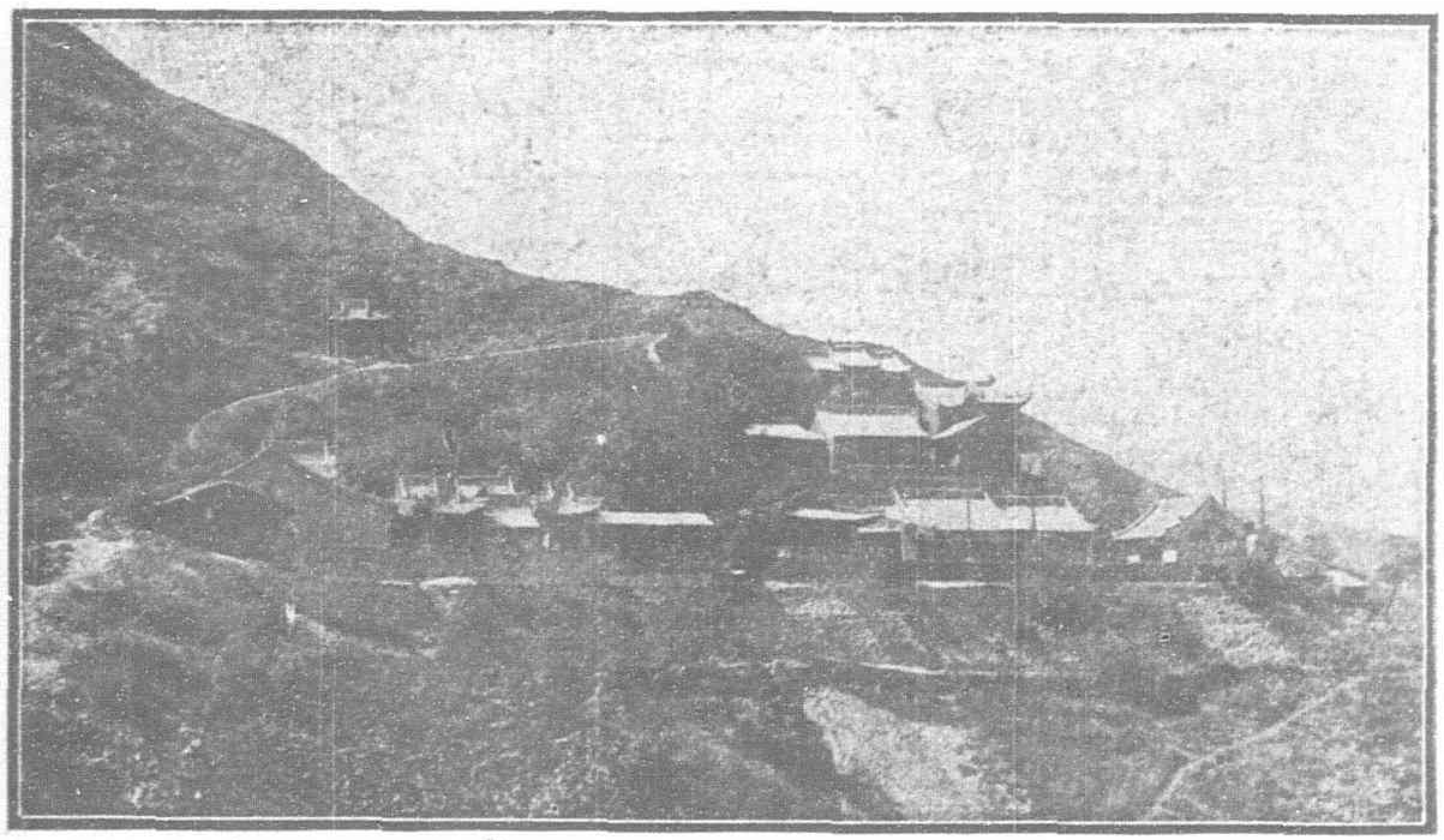


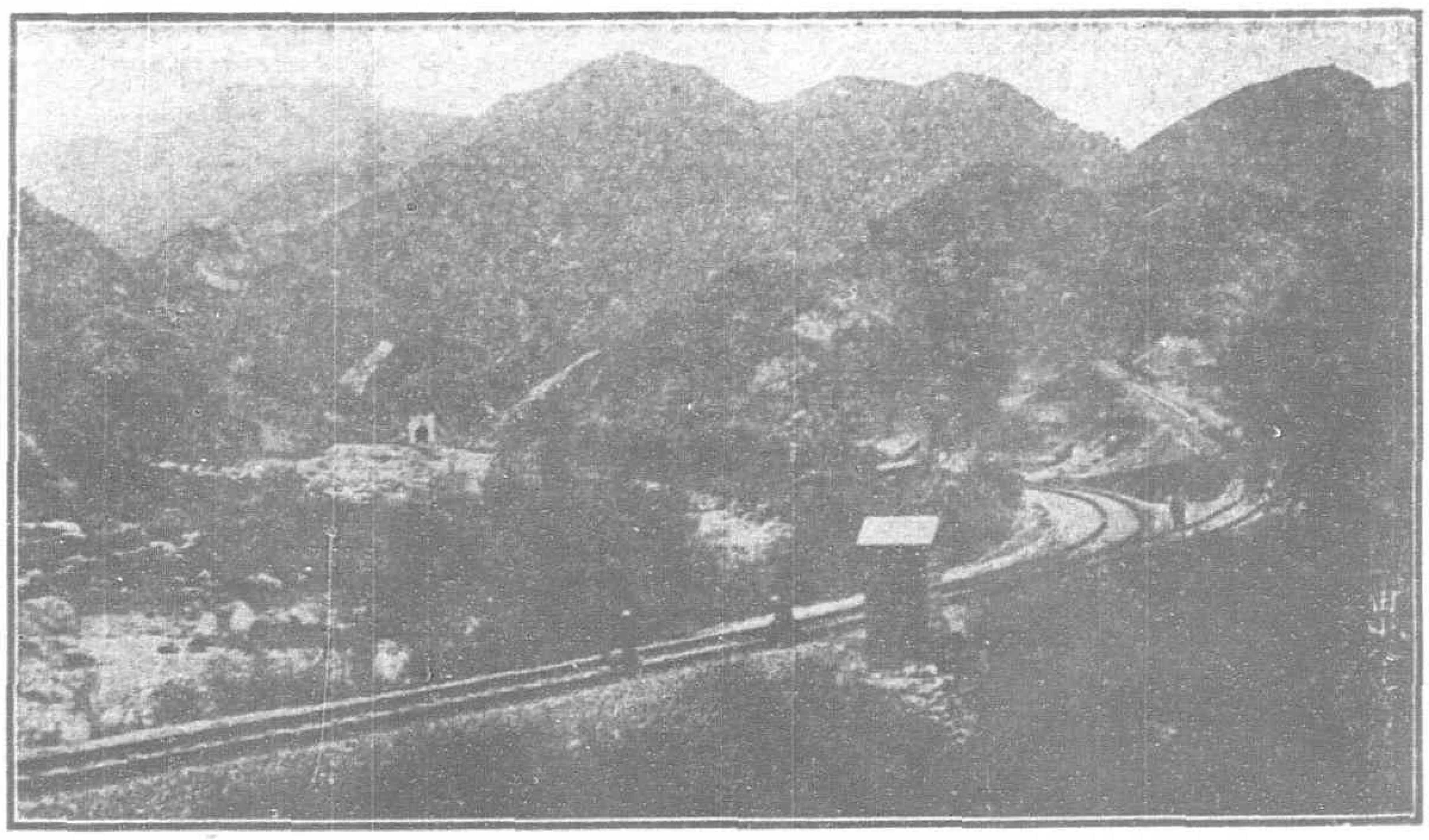
VIEWS ALONG ROUTE OF CHENG-TAI RAILWAY

The trains of this line connect with the through service of the Peking-Hankow Railway, affording Travellers the opportunity of seeing the most picturesque part of China. The line passes through a mountainous section of country, rich in Mineral Resources to the Provincial Capital of Shansi at Taiyuanfu. This interesting city is a great educational center, and famous for the fine quality of its artistic embroideries.

The Peking-Suiyuan Line

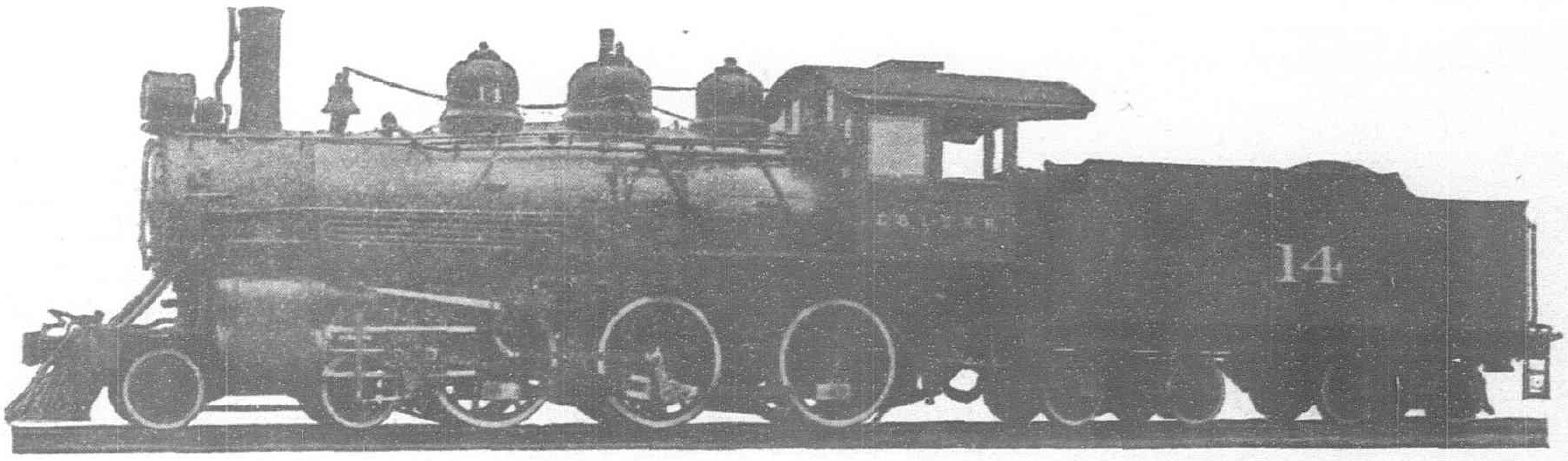
"THE ROAD TO THE GREAT WALL"





This line follows the ancient caravan route and military highway from Mongolia into China by the way of the historic Nankow Pass. This pass is the Key to Peking, and Kalgan is the gate of the Country. From here the great camel caravans set out on their long journeys across Mongolia to Siberia and Central Asia. This old frontier mart, retaining its time-honored characteristics, one of the most interesting sights of the Old World, is made accessible by the new railway. The line also carries the passenger in two hours from Peking to Nankow, when the Great Wall of China and the Ming Tombs may be seen. A foreign hotel is operated by the railway authorities at Nankow, where chairs and guides may be secured for the Tombs.

Ten-wheeled Locomotives



BUILT FOR ESCANABA & LAKE SUPERIOR R. R. Co.

Cylinders, 19" × 26"
Driving wheels, diameter, 58"
Steam pressure, 180 lbs.
Grate area, 29.2 sq. ft.
Water heating surface, 1,590 sq. ft.
Superheating surface, 337 sq. ft.
Weight on driving wheels, 109,700 lbs.
Weight, total engine, 143,600 lbs.
Tractive force, 24,800 lbs.

The locomotive illustrated represents an excellent type for all-round service on comparatively light tracks. It is simple in construction, easy on tracks and flanges, carries about 75 per cent of its weight on driving wheels, and has good speed capacity. This type is specially fitted for work on short roads and branch lines, where it is often desirable to have locomotives that can be used interchangeably in either passenger or freight service.

The Escanaba and Lake Superior is laid with rails weighing 60 pounds per yard, and the wheel loading of locomotive No. 14 is suitable for rails of this weight. This engine uses superheated steam, and is equipped with Walschaerts valve gear, and with piston valves 9½ inches in diameter. The firebox contains a brick arch, and the fire-door is power operated.

Baldwin ten-wheeled locomotives, of both standard and narrow gauges, have been built for export in large numbers. Examples of this type of engine are illustrated and described in Records 82 and 84.

THE BALDWIN LOCOMOTIVE WORKS

Cable Address:—"BALDWIN, PHILADELPHIA" **PHILADELPHIA, PA., U. S. A.**

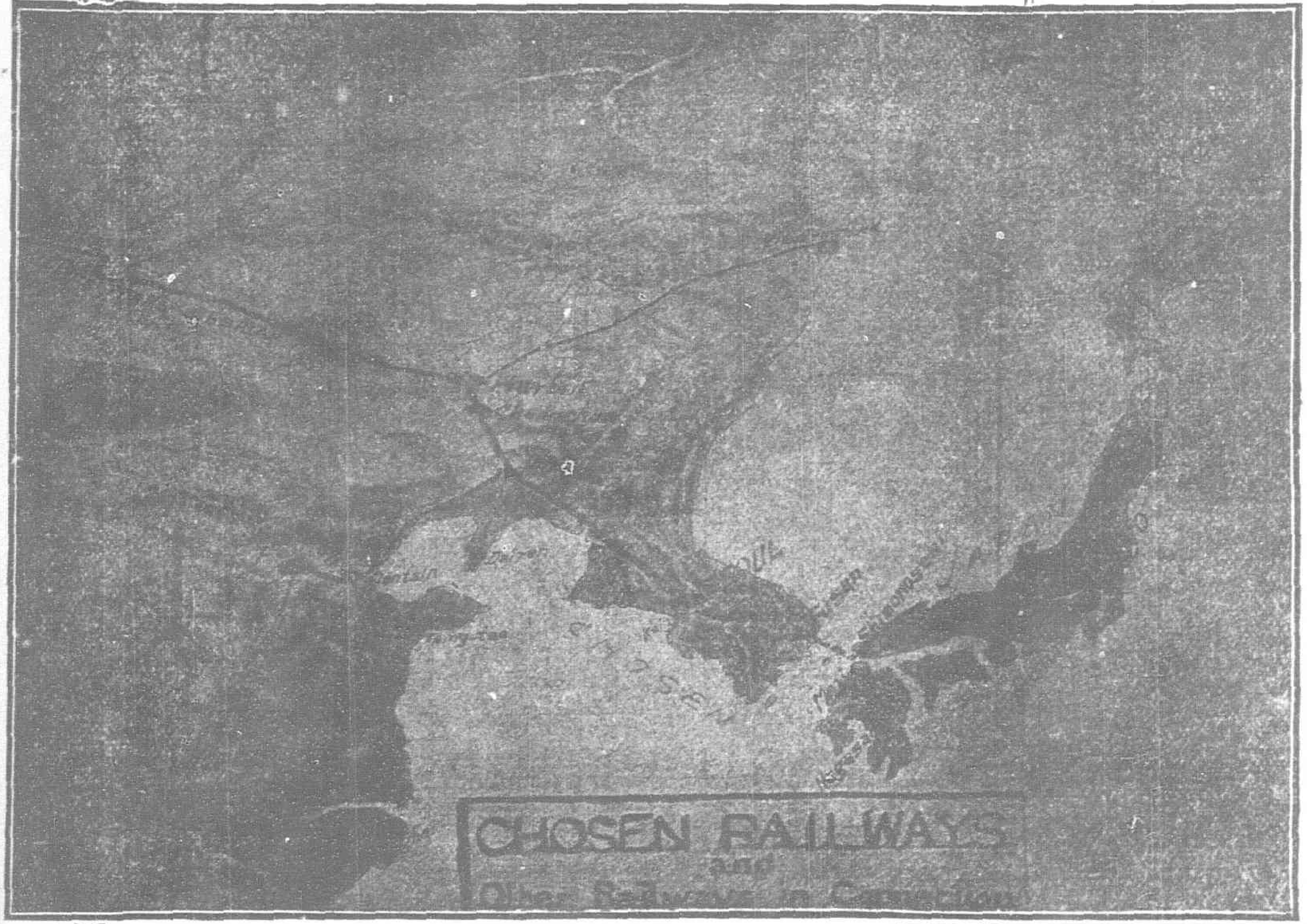
Agents for China, Hongkong, Philippine Islands, Indo-China, Straits Settlement, and Siam:—ANDERSEN, MEYER & Co., Ltd. Head Office, SHANGHAI; Branches: TIENTSIN, PEKING, KALGAN, HARBIN, HANKOW, HONGKONG, CHANGSHA, TSINAN, and VLADIVOSTOCK.

Agents for Japan:—SALE & FRAZAR, Ltd., TOKYO.

Chosen Railways

Most Important Link in the Round-the-World Routes via Siberia.
Safest and Quickest Overland Route between Europe or China and Japan.

Only 10 hours, Sea Passage between the Continent and Japan.
Best Opportunities for studying Unique Conditions in the Far East.



Chosen-Manchuria Express

Fusan-Keijyo (Seoul)-Mukden-Changchun

Weekly Service. Most Up-to-date Accommodation: 1st and 2nd Class Sleeping Cars and a Dining Car.

CONNECTIONS:

With the Trans-Siberian Express.
With the Tokyo-Shimonoseki Train de Luxe.
With the Peking-Mukden Train de Luxe.

Daily Express

Fusan-Keijyo-Antung

Twice a day Service, taking all class Cars, besides 1st and 2nd Class Sleeping Cars (Keijyo-Antung, 1st class car only) and a Dining Car.

CONNECTIONS:

With trains on the South Manchuria Ry.
With express trains on the Japanese Rys.

Through Traffic

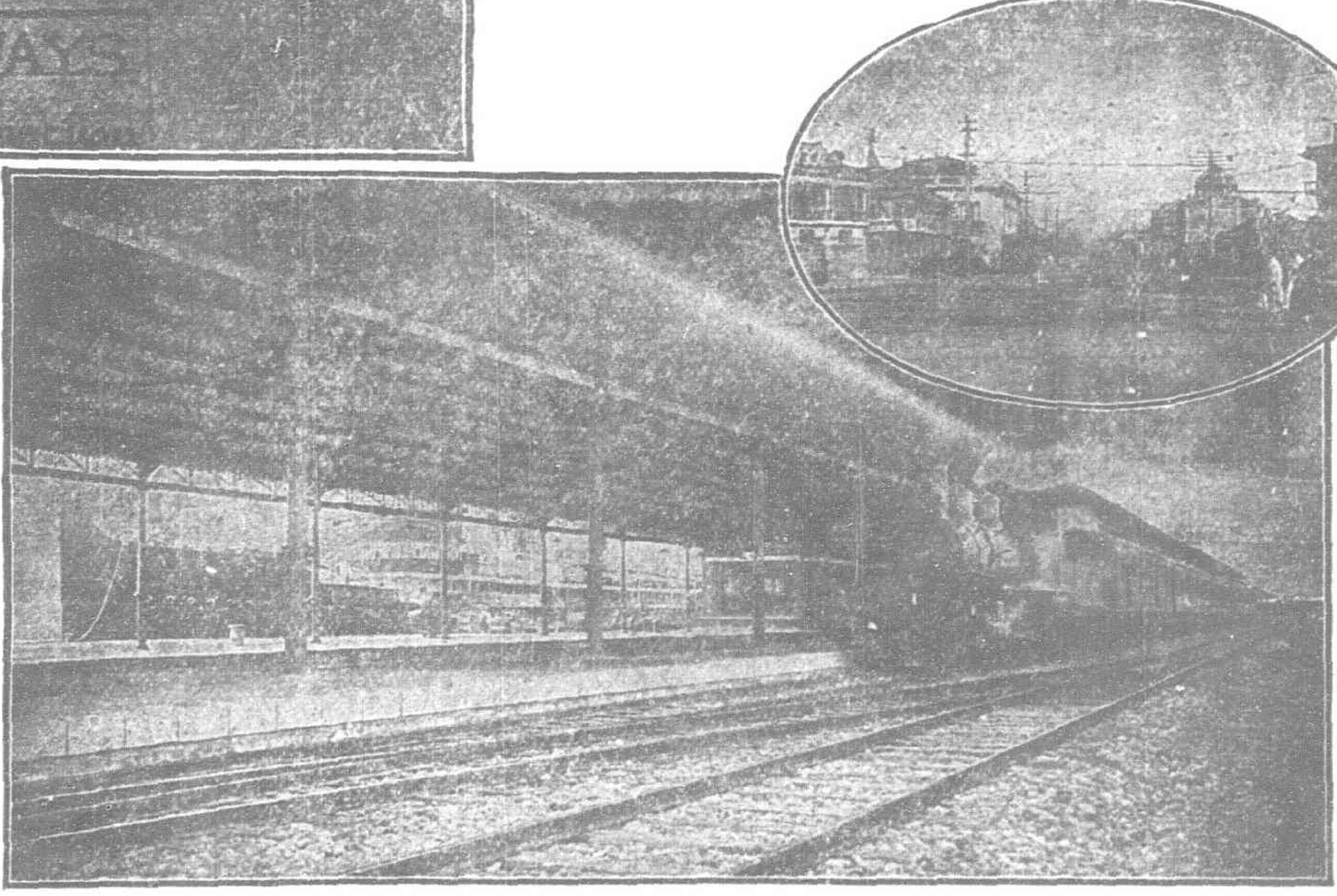
Stations open to through traffic are as follows:—

South Manchuria Railway.—
Dairen, Changchun, Mukden, Yingkou, etc.
Chinese Eastern Railway.—
Tsitsihar, Manchuria and Harbin.
Chinese Government Railways.—
Hsinmingfu, Shanhaikuan, Peking, Tientsin, Shanghai, Nanking, Tsinanfu, Hankow, Nankow and Kalgan.
Russian State Railways.—
Irkutsk, Odessa, Warsaw, Moscow and Petrograd.

⟵ ⟶

Chosen Railways.—
Fusan, Keijyo (Seoul) Heijyo, † Jinsen and † Chinnampo.
Japanese Railways.—
(via Chosen)
Tokyo, Yokohama, † Nagoya, Kyoto, Osaka, Kobe, Shimonoseki, Moji and Nagasaki.

† No through traffic to or from points of the Chinese Eastern Railway and the Russian State Railways.


Fusan Pier A scene in Keijyo (Seoul)

Ticket Agencies

The International Sleeping Car Company; Messrs. Thos. Cook & Son; The Nordisk Resebureau.

Hotels

Under the Direct Management of the Railway Bureau.

CHOSEN HOTEL AT KEIJYO (Seoul).—Cable Add: "CHOHO" 80 bedrooms mostly with bath; Motor-cars meet guests at the station.

STATION HOTELS AT FUSAN AND SHINGISHU.—The most convenient and comfortable stopping places on the upper floors of the two station buildings.

FOR FURTHER PARTICULARS PLEASE APPLY TO

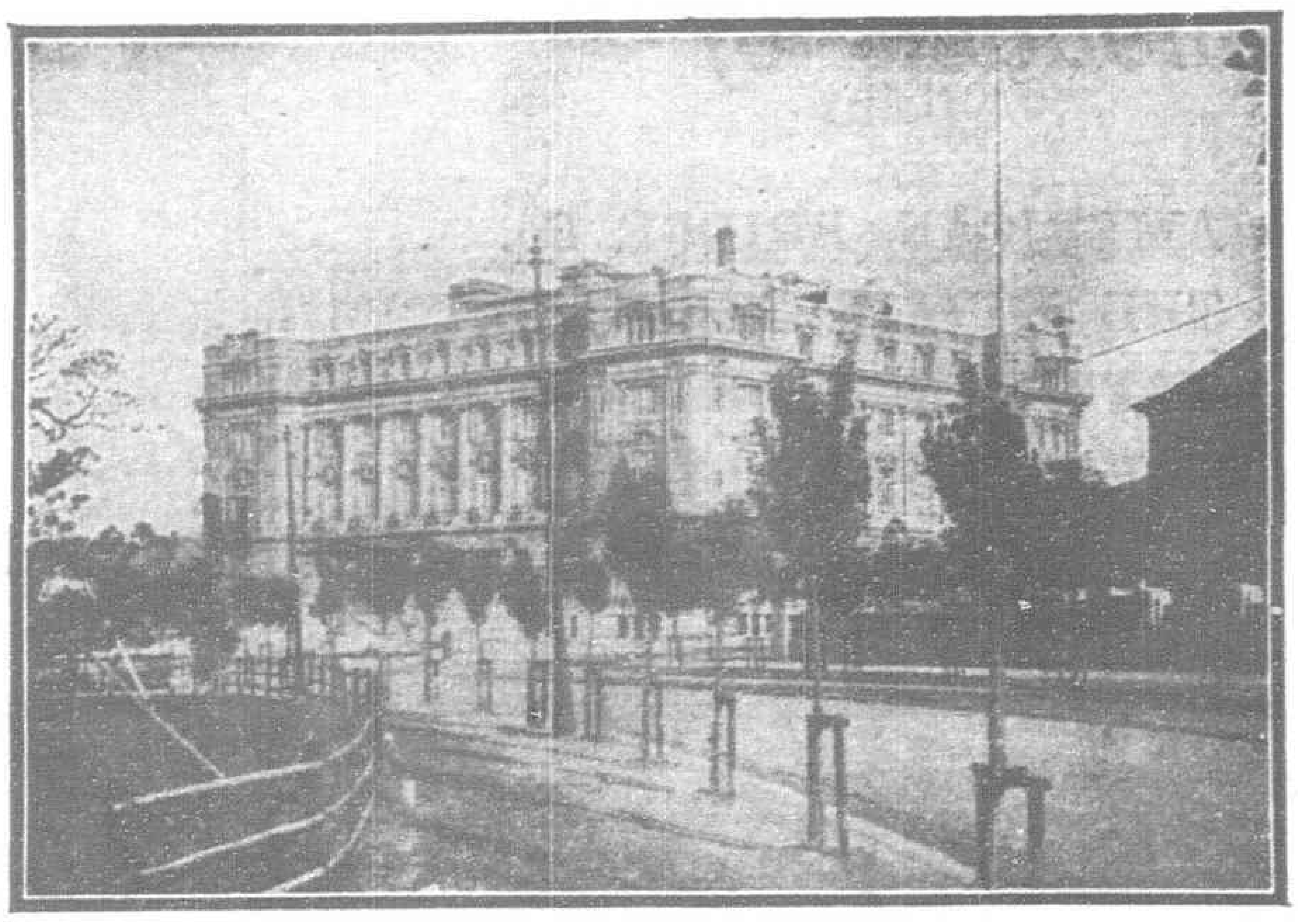
Keijo Office,

South Manchurian Railway Co.,

Tel. Add: "MANTETSU", Keijo. **KEIJO, CHOSEN** **Code Used: A.B.C., 5th Edition.**

SOUTH MANCHURIA RAILWAY

Important Section in the Overland Route between Europe and the Far East



S.M.R. Co.'s Yamato Hotel, Dairen (The Finest Hotel in the Far East).

Save time and Money.

The Quickest, Cheapest, and Safest Route between Europe and the Far East is via Siberia and Manchuria. The South Manchuria Railway Company's Express Trains are equal to the best in Europe and America, and are timed to connect with other Express Trains and Steamers. Sleeping Cars are attached to most of the Ordinary Daily Trains.

How to Reach Shanghai.

Travellers from Europe via Siberia by the Through Express arrive at Dairen in time to catch the S.M.R. Company's Weekly Mail and Passenger Steamer "Sakaki Maru" of the Dairen-Tsingtao-Shanghai Line. This Steamer is turbine driven, equipped with wireless telegraphy, and carries a doctor on board. The "Kobe Maru," which also leaves Dairen weekly, plys direct to Shanghai without calling at Tsingtao.

Important to Travellers and Tourists.

The S.M.R. Co. has established, under its direct management, a series of Yamato Hotels at Dairen, Hoshigaura, Port Arthur, Mukden, and Changchun. All on European lines. Cook and Son's Coupons accepted. Tel. add.: "Yamato"

Health and Holiday Resorts in Manchuria.

The beautiful climate and scenery of Manchuria is fast popularizing it as a health and holiday resort, and special seaside colonies have been established at Hoshigaura (Star Beach), near Dairen, and Ogondai (Golden Beach), near Port Arthur.

Of Interest to Shippers.

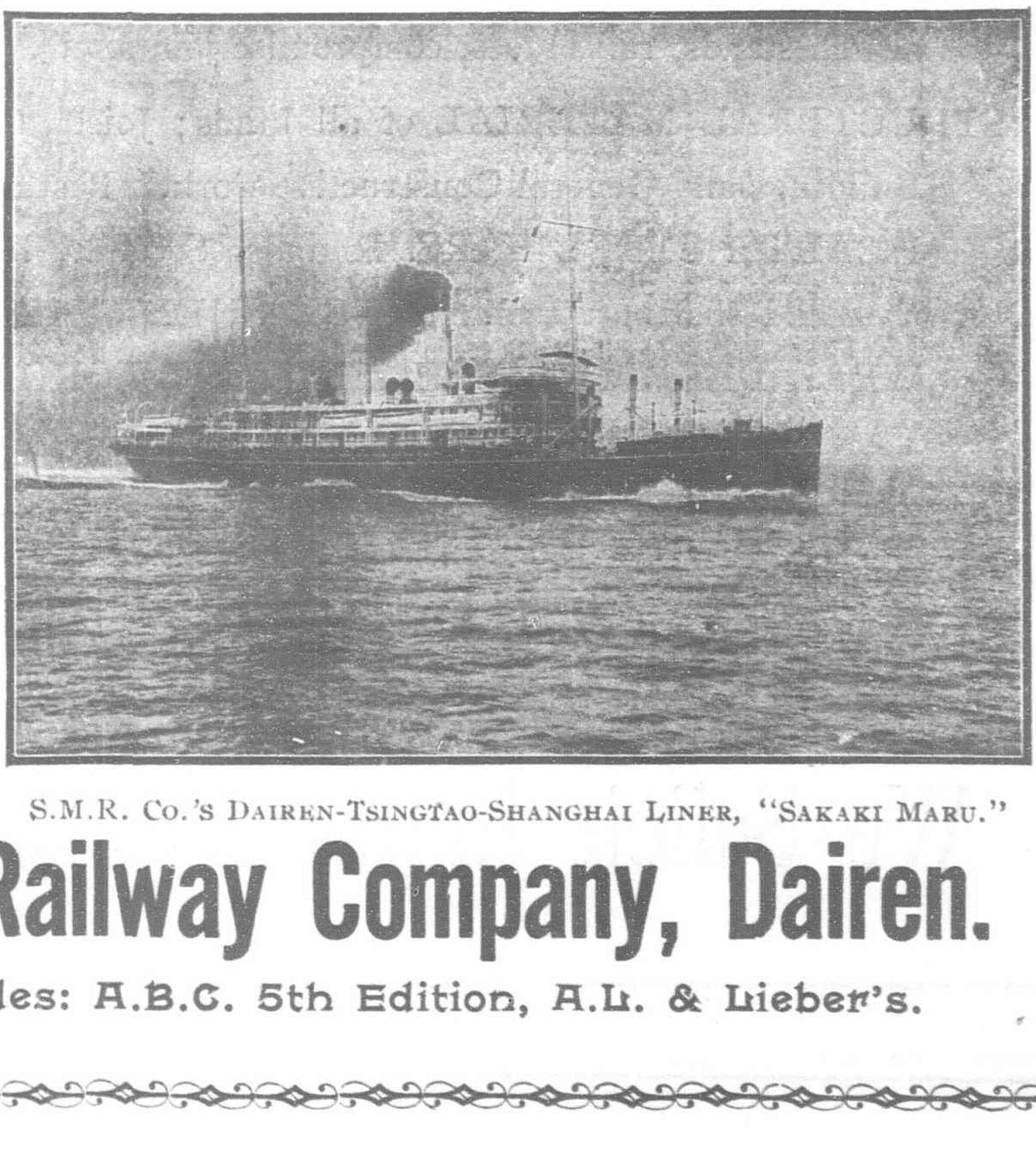
In addition to its Dairen-Tsingtao-Shanghai Liners, the S.M.R. Co. run a fleet of cargo steamers between Dairen and Hongkong, calling at ports en route. Other Steamship Companies have regular services to and from Dairen. Particulars may be obtained from the Manager of the Wharf Office, Dairen.

Best Steaming Coal in the Far East.

Large stocks of the S.M.R. Company's Coal from the famous Fushun Collieries are always kept at Dairen, Port Arthur, Newchwang (Yingkou), and Tientsin Depots, and can also be obtained at Chefoo, Shanghai, Hongkong, Singapore, and Penang. For special contracts apply Manager, Mining Dept., S.M.R. Co., Dairen.

Ticket Agents.

The S.M.R. Company's Railway and Steamer Tickets, Illustrated Guide Books, and Handbooks of Information can be obtained at all the Offices and Agencies of Messrs. Thos. Cook & Son, the International Sleeping Car and Express Trains Co., and the Nordisk Resebureau; the Nippon Yusen Kaisha, Shanghai; the S.M.R. Branch Wharf Office, Shanghai; or direct from the



S.M.R. Co.'s Dairen-Tsingtao-Shanghai Liner, "Sakaki Maru."

South Manchuria Railway Company, Dairen.

Tel. Add.: MANTETSU. **Codes: A.B.C. 5th Edition, A.L. & Lieber's.**

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Exporters of the products of

CARNEGIE STEEL Co.
ILLINOIS STEEL Co.
AMERICAN STEEL & WIRE Co.
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AMERICAN BRIDGE Co.
THE LORAIN STEEL Co.
NATIONAL TUBE Co.
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TENNESSEE COAL, IRON & RAILROAD Co.

STEEL SHEETS, plain and corrugated; galvanized and painted. Galvanized sheets "APOLLO" brand. Black sheets "EAGLE" brand. Copper bearing sheets "KEYSTONE" brand, either black or galvanized.

TIN PLATE, "COKE," "CHARCOAL" and "TERNE."

PIPE, black and galvanized wrought, for steam, gas and water; American or English Standards. Lapwelded steel BOILER TUBES. CASING, TUBING and DRIVE PIPE. Oil and Gas line Pipe. CONVERSE and MATHESON lead joint pipe. TUBULAR STEEL POLES. Lapwelded and seamless CYLINDERS. SEAMLESS STEEL TUBING.

STEEL RAILS (Vignole) of all sections. Groove and guard rails for tramways. RAILS and ACCESSORIES. SPECIAL TRACK WORK, points and crossings. Manganese Steel Insert and Solid Manganese Steel for electric and steam railroads. Portable SWITCHES, switch stands, rail braces, compromise joints, etc. STEEL RAILWAY TIES (Sleepers).

STRUCTURAL MATERIAL of all kinds; Joists, Channels, Tees, Angles, etc., for Bridges, Buildings and General Constructive work. Best quality BESSEMER and BASIC OPEN HEARTH STEEL BARS, Rounds, Squares, Flats, Ovals and Hexagons. Special bolt, rivet and shafting steel. STEEL SHEET PILING, STEEL MINE TIMBERS, OIL WELL DERRICKS, SCHOEN SOLID FORGED AND ROLLED STEEL WHEELS. VANADIUM STEEL, GEAR BLANKS.

FORGED AXLES of highest quality for Locomotives, Railroad and Tramway Cars. FORGINGS.

HOOPS for barrels and casks, and TIES for baling.

We Solicit Inquiries accompanied by exact specifications stating quantity

UNITED STATES STEEL PRODUCTS CO.

Union Building No. 4 The Bund, Shanghai

Telegraphic Address:
"STEELYARD" SHANGHAI

Head Office No. 30 Church Street, New York

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HAVANA
JOHANNESBURG
LIMA
MEXICO CITY
MONTREAL
NEW GLASGOW
PARIS
PETROGRAD
RIO DE JANEIRO
SANTIAGO
SHANGHAI
SAO PAULO
SOERABAYA
SYDNEY
TORONTO
VALPARAISO
VANCOUVER
WINNIPEG

MILD STEEL PLATES for ships' tanks, stacks and boilers. Flange and fire-box steel. Checkered plates.

WIRES, baling and fencing; all classes of coated and uncoated for manufacturing purposes. Genuine "IOWA," "GLIDDEN" and "WAUKEGAN" barb wire. Fence and netting STAPLES. Tinned mattress, broom and bottling wire. Woven Wire Fence. FABRIC FOR REINFORCING CONCRETE. Wire Nails and Tacks of all descriptions.

INDESTRUCTIBLE CYLINDRICAL STEEL FENCE POSTS.

HORSE and MULE SHOES. COLD DRAWN SHAFTING and COLD ROLLED PLATES for deep stamping, etc.

AERIAL TRAMWAYS. Bleichert System. Locked coil track cable, locked wire cable and smooth coil track cable for Aerial Tramways.

IRON and STEEL WIRE ROPE, bright and galvanized for all purposes. Bright and galvanized SASH CORD, galvanized CLOTHES LINES. Bare and insulated COPPER WIRE and CABLE of every description.

COPPER RAIL BONDS, solid and stranded for electric railways.

WEATHER PROOF INSULATED telephone and signal WIRE. Galvanized telegraph and telephone wire.

ROUND and FLAT WIRE STEEL SPRINGS. PIG IRON, COAL and COKE.

FABRICATED MATERIAL for railway bridges, highway bridges, turntables, transfer tables, barges, steel chimneys, steel buildings, mill buildings, office buildings, tanks, towers, transmission towers, trestles, cylinder piers.

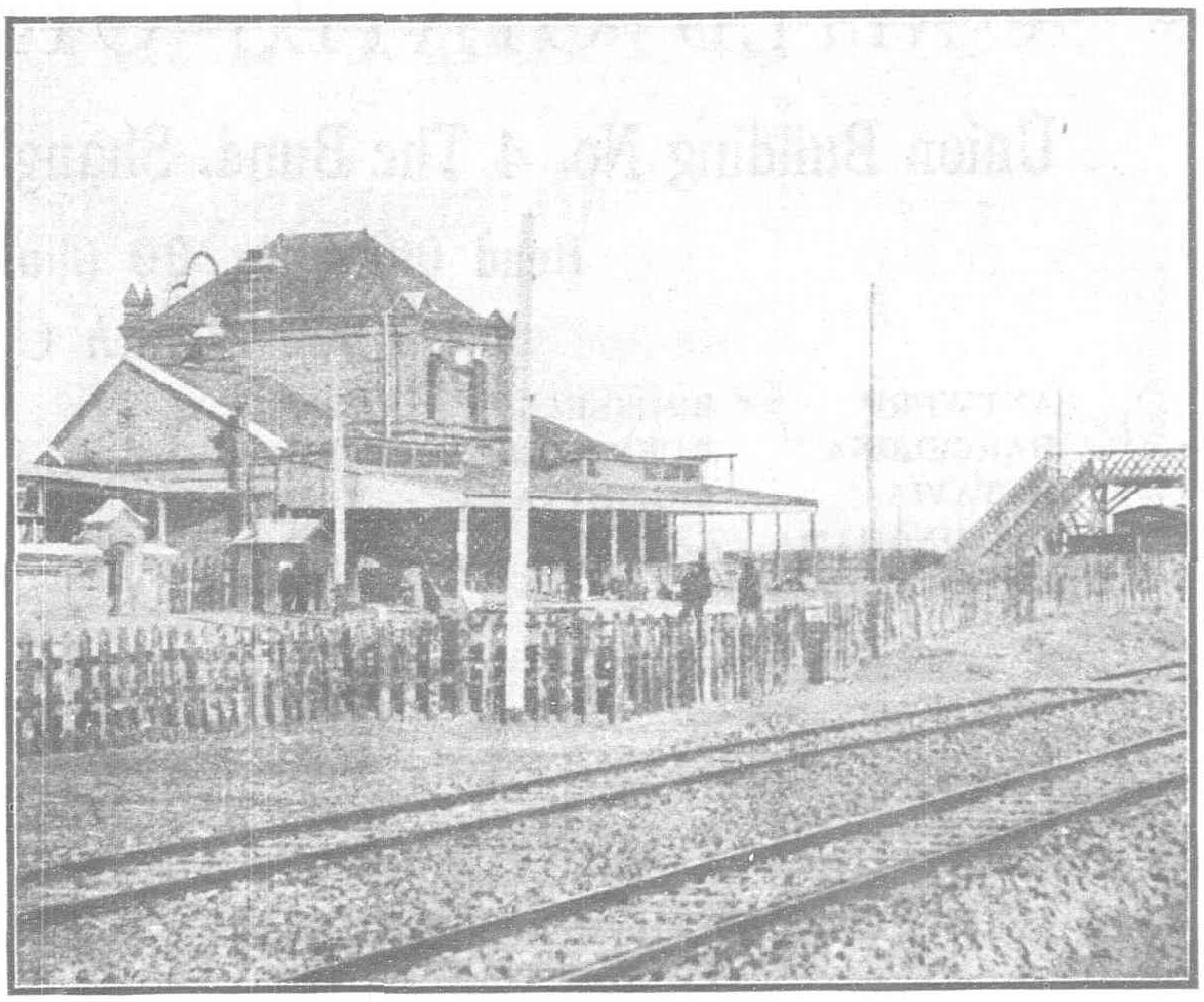
desired, with full particulars as to size, weight, finish, packing, etc. Special catalog on application.

中華民國政府吉長鐵路行車時刻表

CHINESE GOVERNMENT RAILWAYS KIRIN-CHANGCHUN LINE

TIME TABLE

DOWN TRAINS		STATIONS	UP TRAINS	
DAILY			DAILY	
MIXED	MAIL		MAIL	MIXED
P.M. 1.20	A.M. 8.30 d.	TOUTAOKOU	P.M. a. 6.00	A.M. 11.10
1.30 1.39	8.40 a. 8.42 d.	2.79 CHANGCHUN	d. 5.50 a. 5.45	11.00 10.56
2.14 2.19	9.12 a. 9.14 d.	12.69 KALUN	d. 5.15 a. 5.13	10.22 10.19
2.49 2.51	9.44 a. 9.45 d.	11.13 YINMAHO	d. 4.43 a. 4.42	9.46 9.40
3.07 3.09	9.58 a. 10.00 d.	5.38 HSIACHIUTAI	d. 4.29 a. 4.27	9.25 9.20
3.22 3.24	10.12 a. 10.13 d.	4.58 YINGCHENGTZE	d. 4.14 a. 4.13	9.07 9.05
3.51 3.55	10.35 a. 10.43 d.	9.14 TUMENLING	d. 3.53 a. 3.48	8.42 8.37
4.42 4.46	11.22 a. 11.24 d.	9.26 HUAPICHANG	d. 3.08 a. 3.06	7.51 7.47
5.07 5.08	11.37 a. 11.38 d.	6.46 KUTIENTZE	d. 2.52 a. 2.51	7.30 7.28
5.27 5.32	11.53 a. 11.55 d,	6.83 KIUCHAN	d. 2.37 a. 2.35	7.11 7.07
5.58	12.15 a.	8.30 KIRIN	d. 2.15	6.45



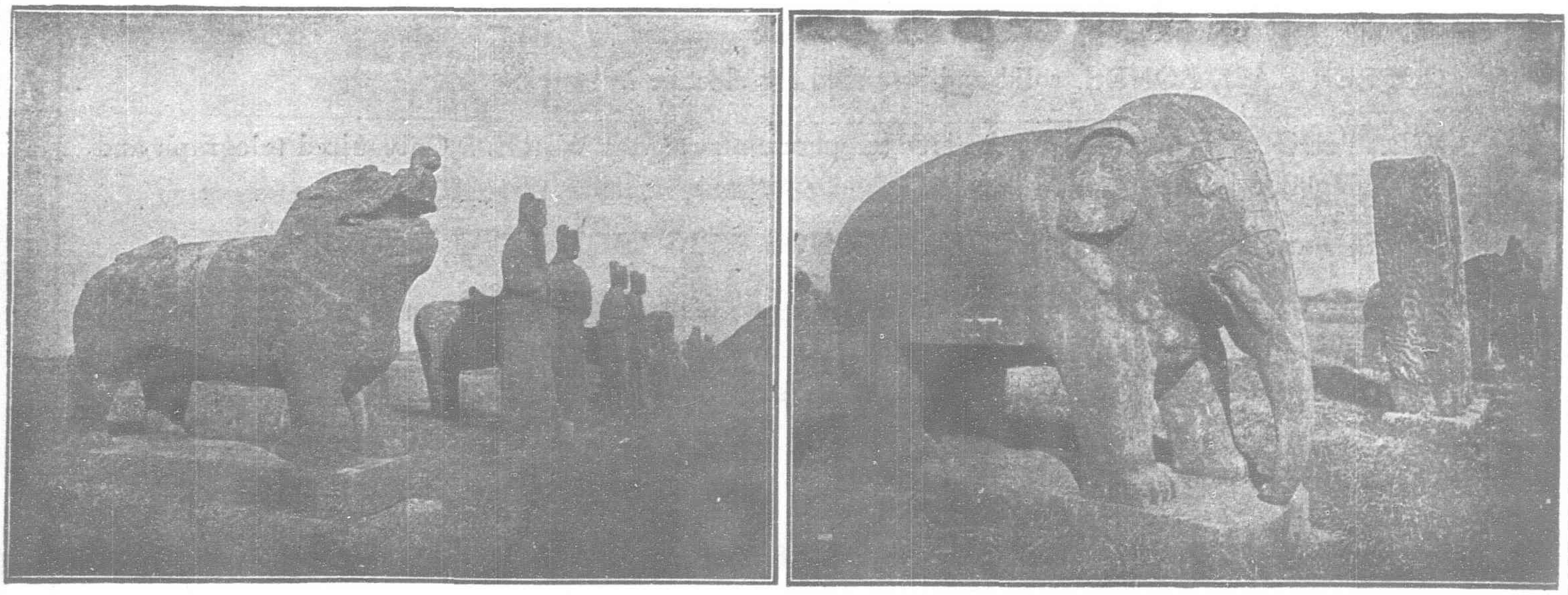
CHANGCHUN STATION

NOTICE:—"d"=Departure. "a"=Arrival.
25th November 1917

THE PIENLO RAILWAY

(KAIFENG-FU TO HONANFU)

"THE FIRST SECTION OF THE PROJECTED CENTRAL TRUNKLINE"



THE SUNG TOMBS NEAR KAIFENG-FU ON THE PIENLO RAILWAY.

The line connects with the through service of the Peking-Hankow Railway at Tcheng Tchéou, enabling the traveller to visit Kaifengfu, the provincial capital of Honan, and the old capital of the Empire at Honanfu.

Products

- Air Brakes
- Circuit Breakers
- Compensators
- Compressors
- Controllers
- Converters
- Cooking Devices
- Fan Motors
- Generators, Alternating and Direct Current
- Generating Sets
- Heating Devices
- Hoists, Electric
- Instruments
- Lamps, Arc
- Lamps, Incandescent
- Lightning Arresters
- Line Material
- Locomotives, Mine, Railway and Industrial
- Meters
- Motors
- Motor-Generators
- Panel Boards and Cabinets
- Projectors, Searchlight
- Pumps, Electrically Driven
- Railway Equipment
- Rectifiers, Mercury Arc
- Regulators
- Rheostats
- Supplies, General
- Switchboards
- Switches
- Transformers
- Turbine Generators
- Watthour Meters
- Wire and Cables
- Wiring Devices

A Mammoth Bridge is no more wonderful an engineering achievement than this little MAZDA Lamp

When you snap a switch and a lamp flashes into brilliance, have you ever thought of it as an *engineering accomplishment?*

In the building of this little lamp, just as many sciences, just as much technical skill and engineering experience are required as in the building of a gigantic bridge.

But after all, its the bright, white, inexpensive LIGHT it gives that makes the EDISON MAZDA lamp a wonderful achievement. Shining with three times the brightness of the old style carbon lamp, EDISON MAZDA comes three times nearer to bridging the gap between sundown and sunrise.

6647

EDISON MAZDA LAMPS

Made in U.S.A. and backed by MAZDA Service

General Electric Company

General Office: Schenectady, N. Y.

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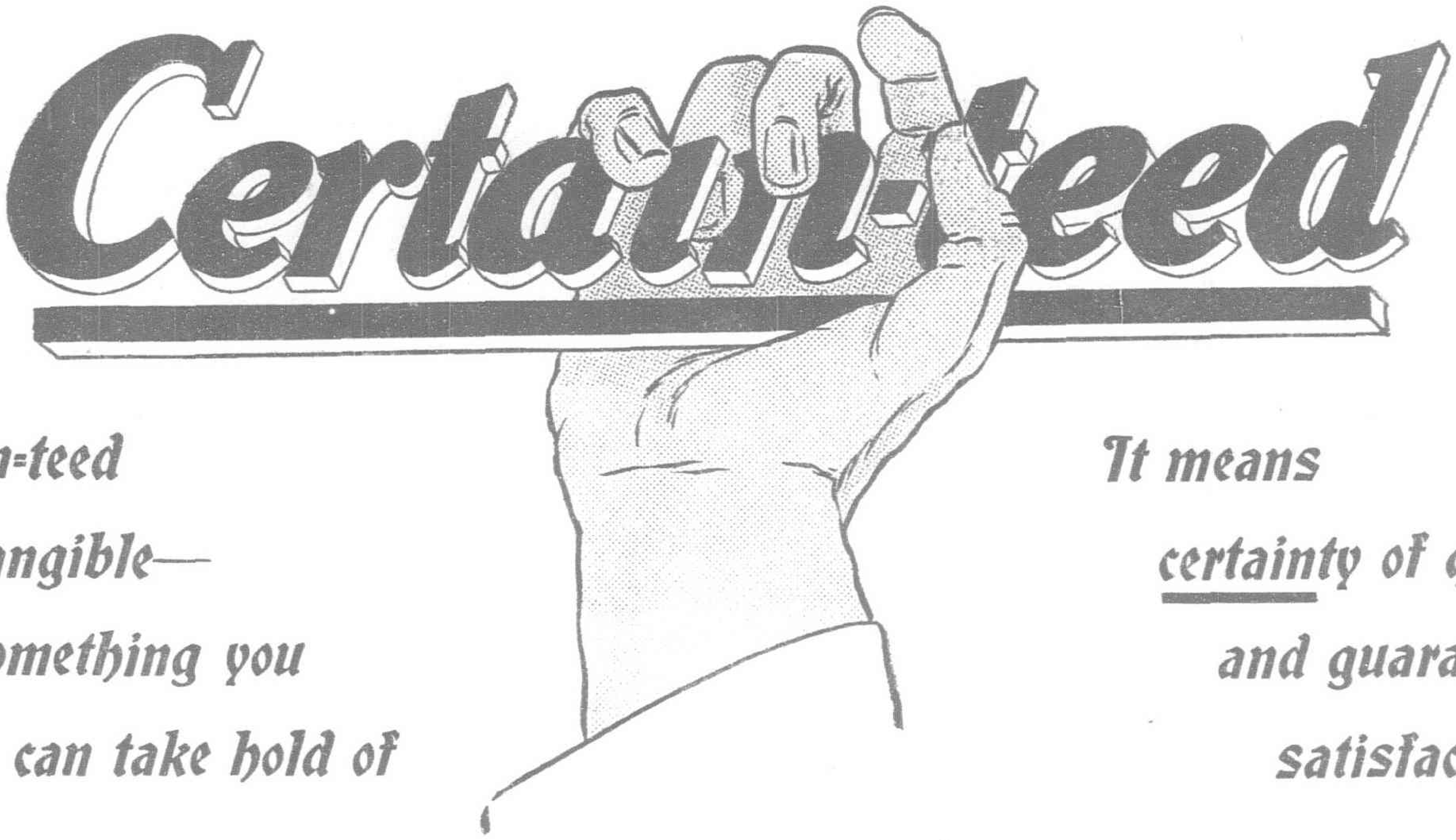
Yokohama—General Electric Company, 23 Water Street
Yokohama—Bagnall and Hilles, 42, Yamaschita Cho.
Tokyo—Mitsui Bussan Kaisha, Ltd., 1, Suruga Cho.
Shanghai—Andersen, Meyer & Co., Ltd., 5 Yuen Ming Yuen Road
Manila—Frank L. Strong Machinery Co., 64-68 Calle Echague



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is tangible—
something you
can take hold of

It means
certainty of quality
and guaranteed
satisfaction

Certain-teed Roofing

For Office buildings, factories, hotels, stores, godowns, garages, etc.
LIGHT IN WEIGHT, WEATHERPROOF, CLEAN, SANITARY, AND FIRE RETARDANT
Made in one, two, and three ply thickness

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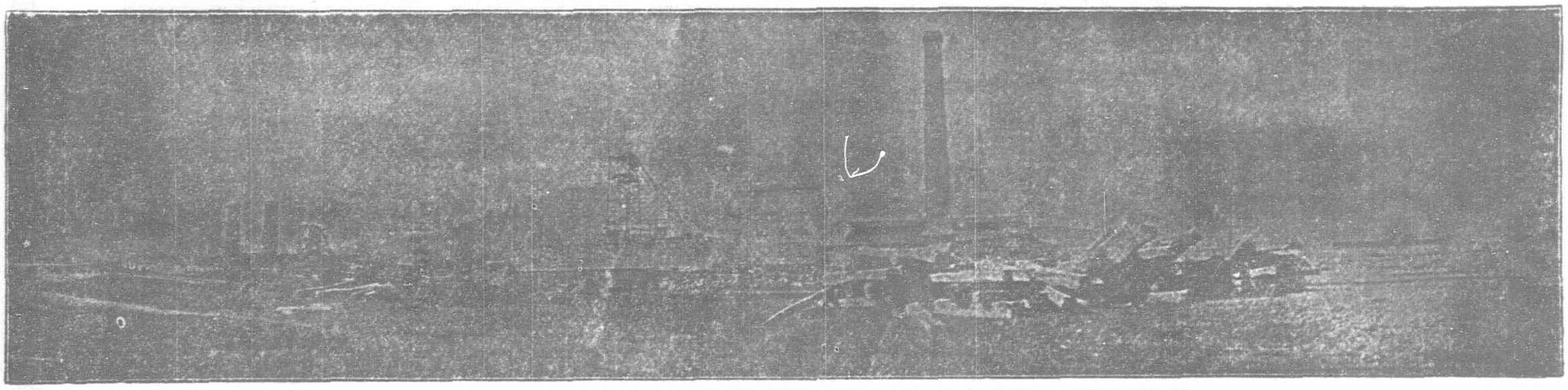
CHINESE GOVERNMENT RAILWAYS

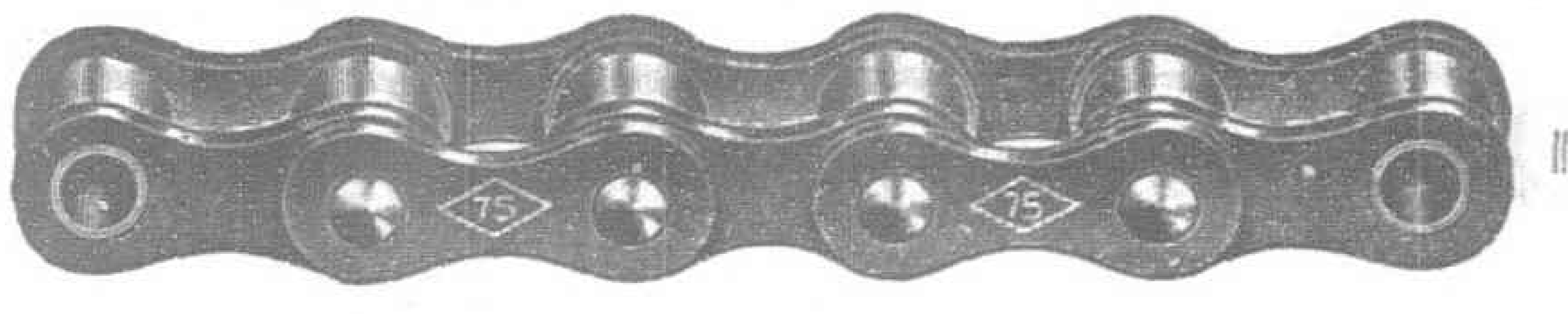
THE TAO-CHING RAILWAY
TAOKOU TO CHINGHUA
(CHINESE GOVERNMENT HONAN LINE)



GENERAL VIEW OF COAL MINES ON THE LINE OF THE TAO-CHING RAILWAY

"China's Road of Anthracite"

THE TRAINS OF THIS LINE CONNECT AT SIN-SIANG-SIEN WITH THE THROUGH SERVICE OF THE PEKING-HANKOW RAILWAY. IT TAPS THE GREAT ANTHRACITE COAL DEPOSITS OF SHANSI, AND CONVEYS THE PRODUCTS OF THE MINES TO THE NEAREST NAVIGABLE RIVER.



Diamond Chains

FOR

Cycles and Motorcycles

Diamond Cycle Chains (furnished ½ or 1-inch pitch) are built for strength and wearing. High carbon steel, capable of withstanding a pressure of 140,000 pounds to the square inch, is used for the side links. All wearing parts, made from steels of special analysis, are heat-treated by a process recognized by authorities on heat treating as the most advanced.

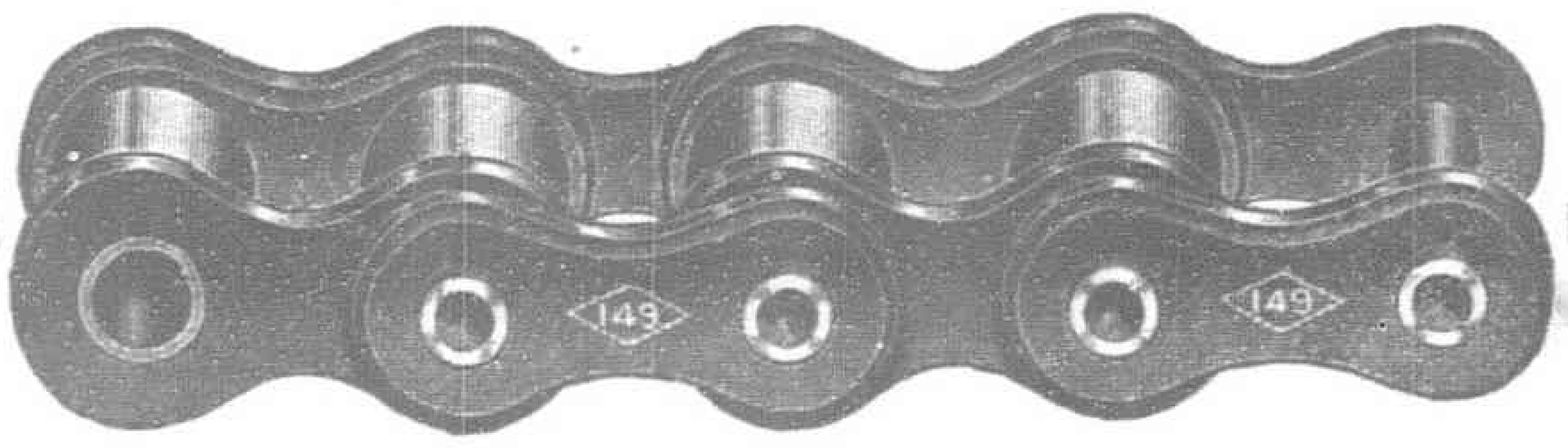
No. 149—⅝-inch pitch Diamond Motorcycle Chain was designed to meet the most severe service conditions. A special alloy steel is used for the rollers, making them practically unbreakable. The wearing parts are hardened by the same process as used for those of our heavy truck chains. Consider what these features mean in motorcycle service.

Special care given to Export shipments.
Correspondence solicited in any language.
Catalogues, samples and prices on application.

Australian Representatives: Acme Cycle Company, Melbourne.
Russian Representatives: International Manufacturers Sales Co., Moscow.

DIAMOND CHAIN & MFG. COMPANY
Indianapolis, Indiana, U. S. A.

Cable Code—A. B. C., 4th and 5th Editions.
Cable Address—"*Chain*", Indianapolis.



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Manufacturers of
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Open Hearth Steel Products

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Wire Nails
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Pig Iron, Blooms, Billets, Wire Rods, Hard Spring Coil Wire, Twisted Cable Wire, Telephone Wire, Bale Ties, Steel Hoops, Steel Bands, Cotton Ties and Fabricated Stock, Poultry and Lawn Fencing.

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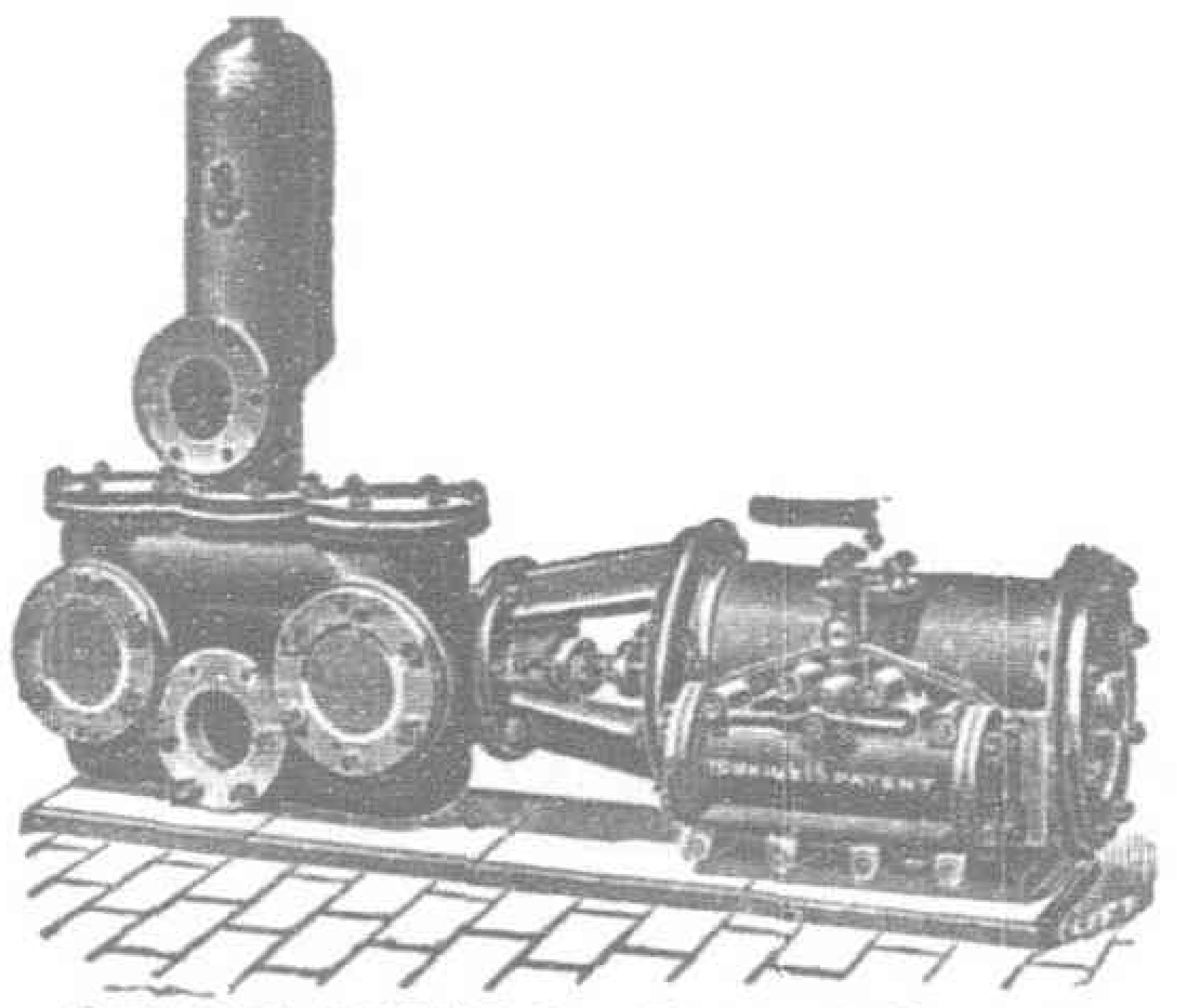
WE MANUFACTURE

PUMPS

FOR EVERY PURPOSE

To be worked by HAND, STEAM, BELT, WIND, WATER or ELECTRIC POWER.



STEAM PUMP for General Purposes.

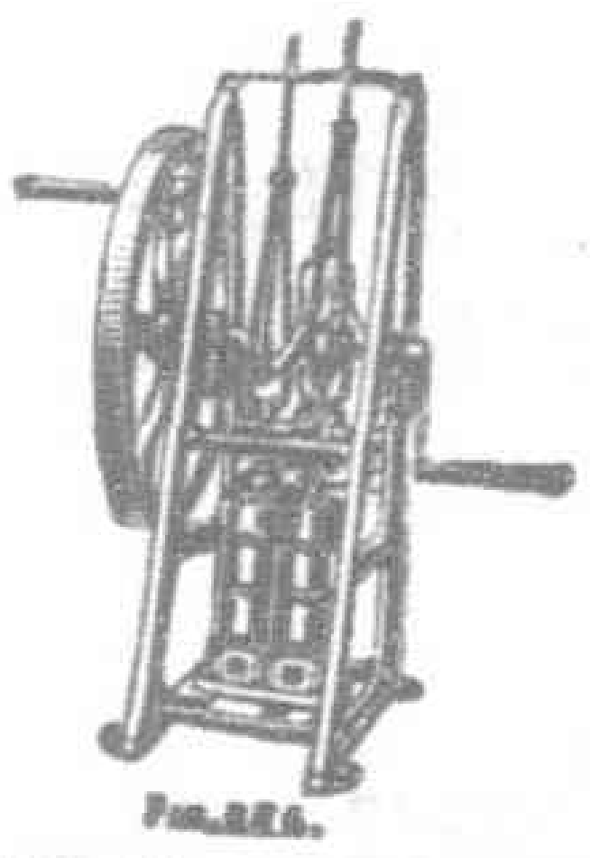
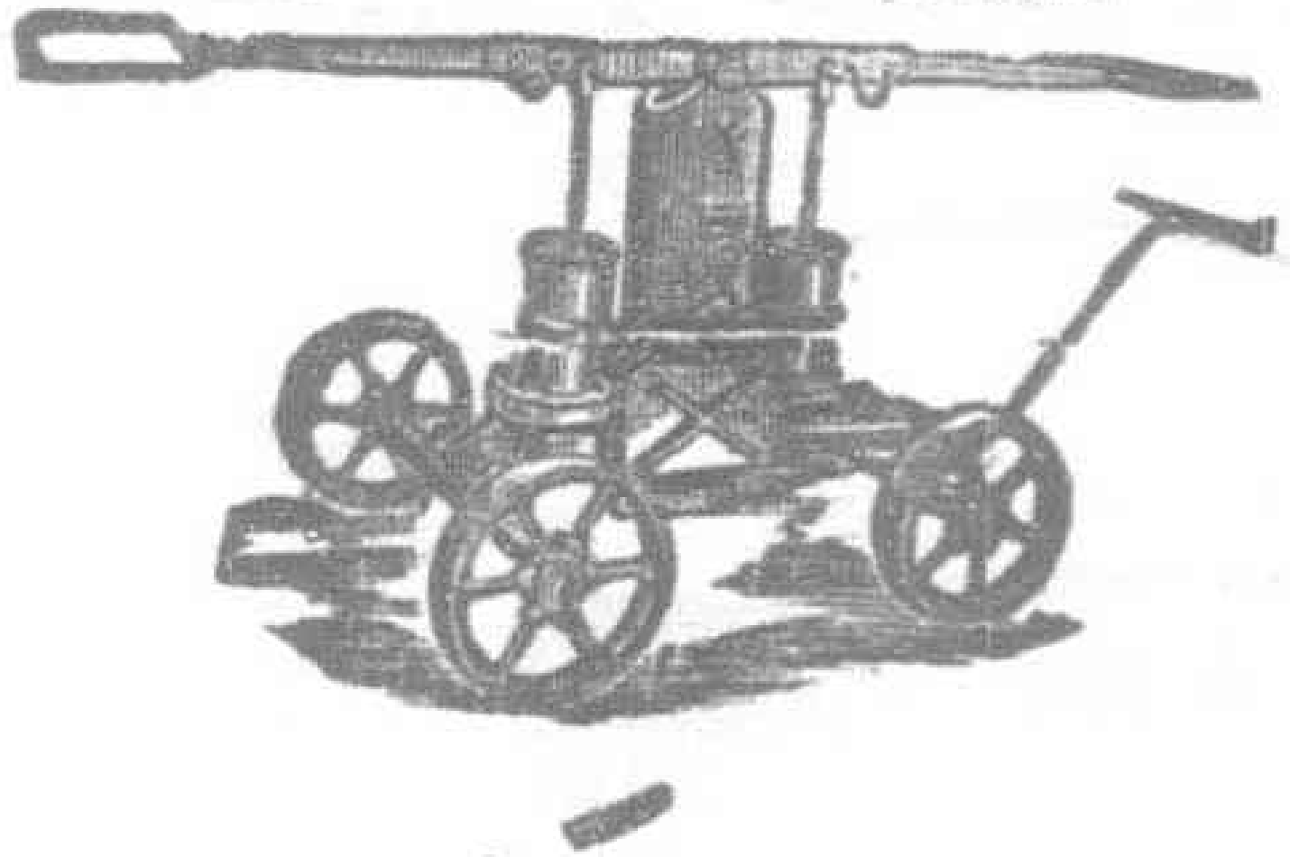
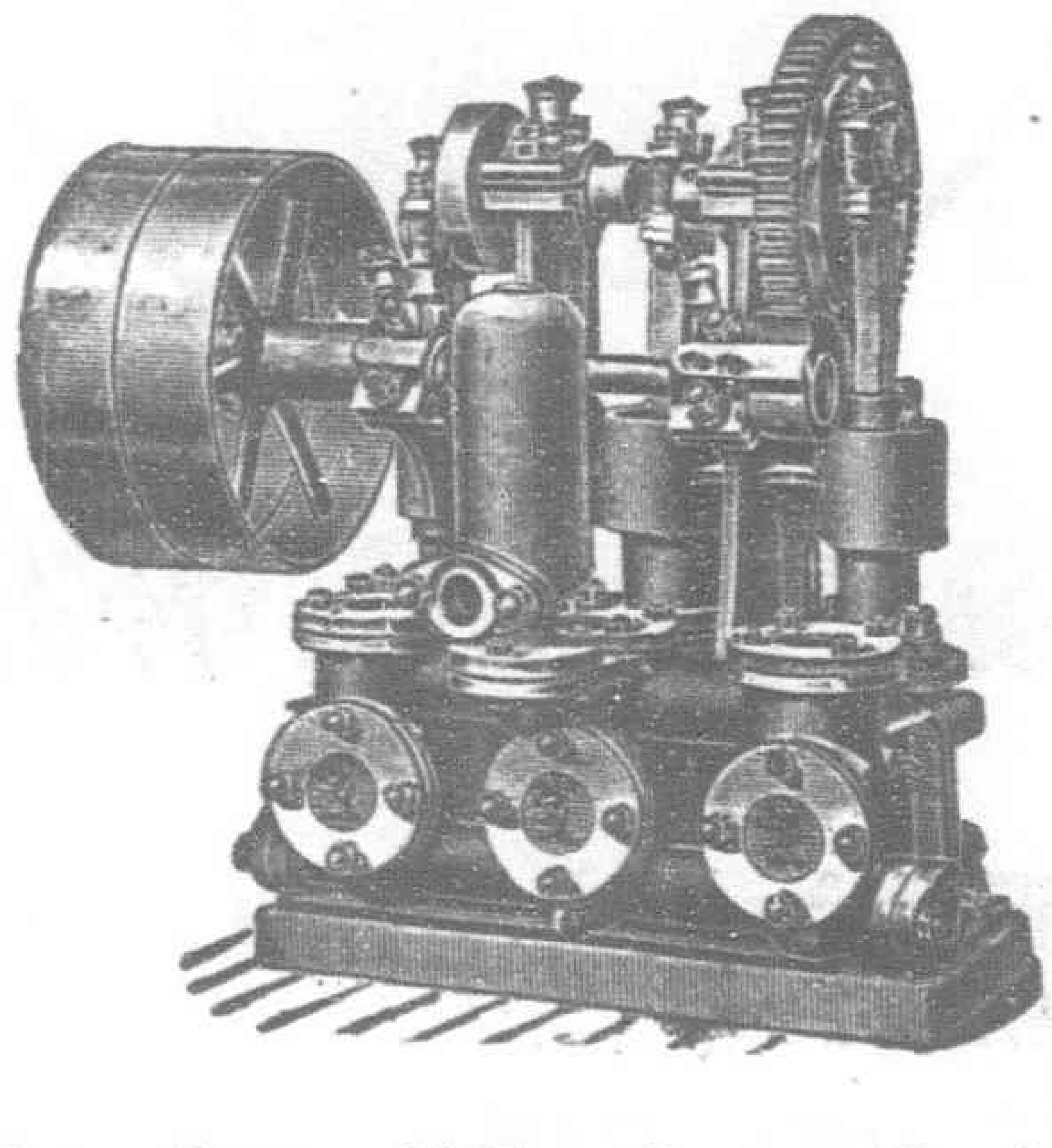
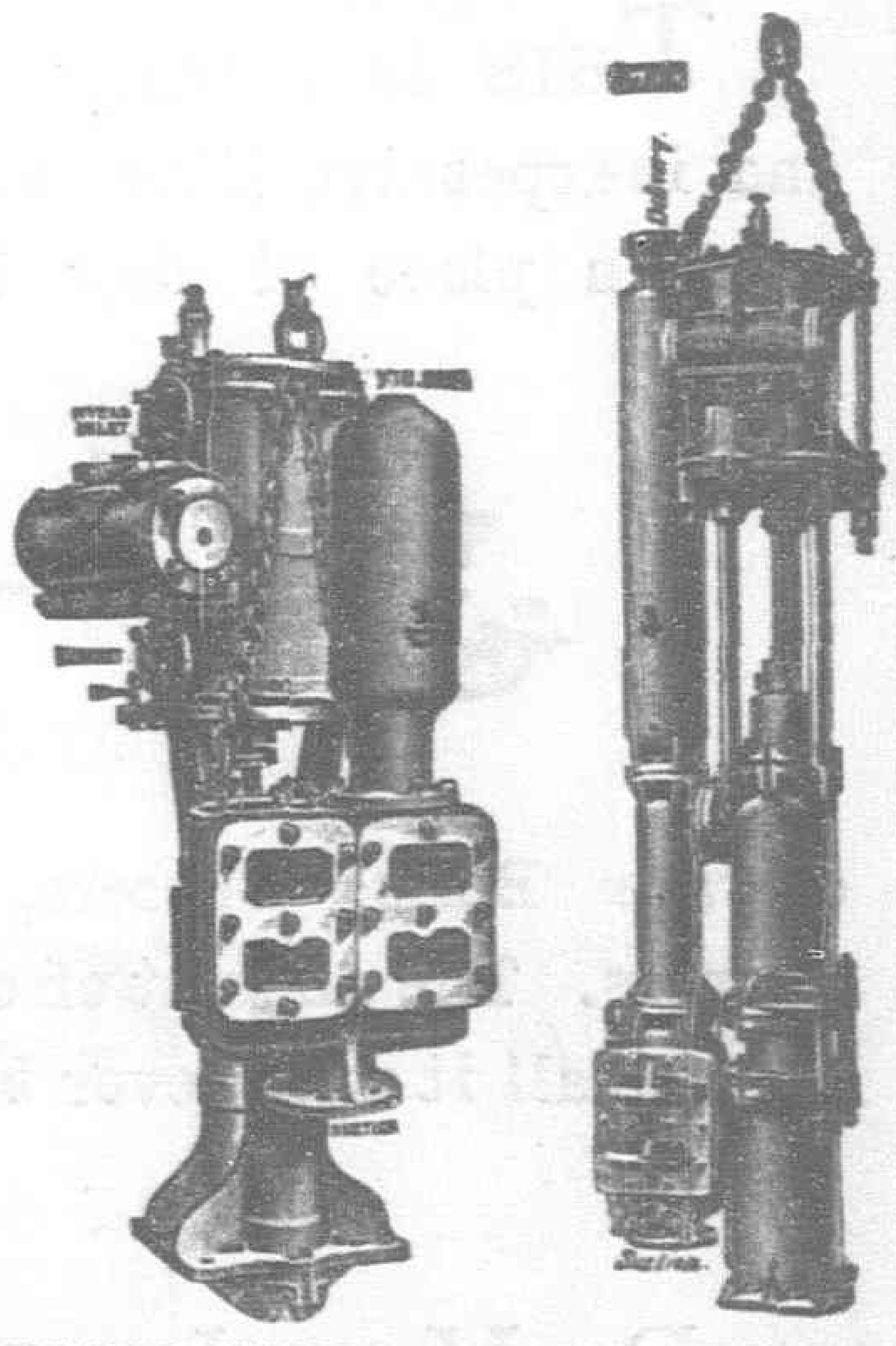


Fig.225.

Fig.166.







SINKING PUMPS for COLLIERIES, MINES, Etc.

Fig.191.

Write for "Eastern" List.

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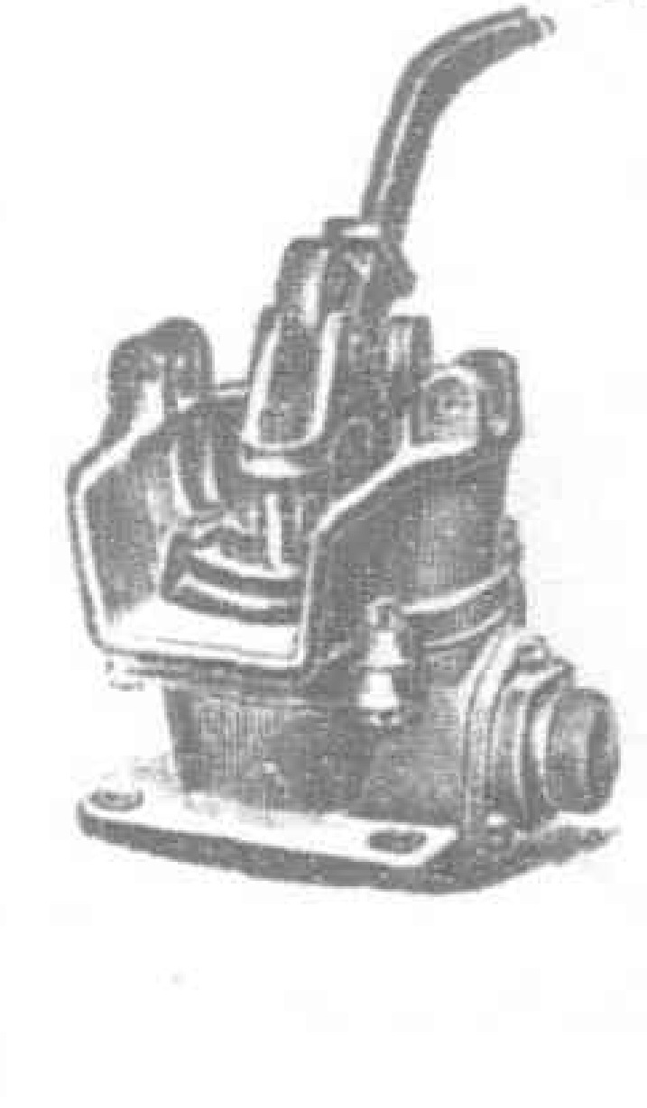


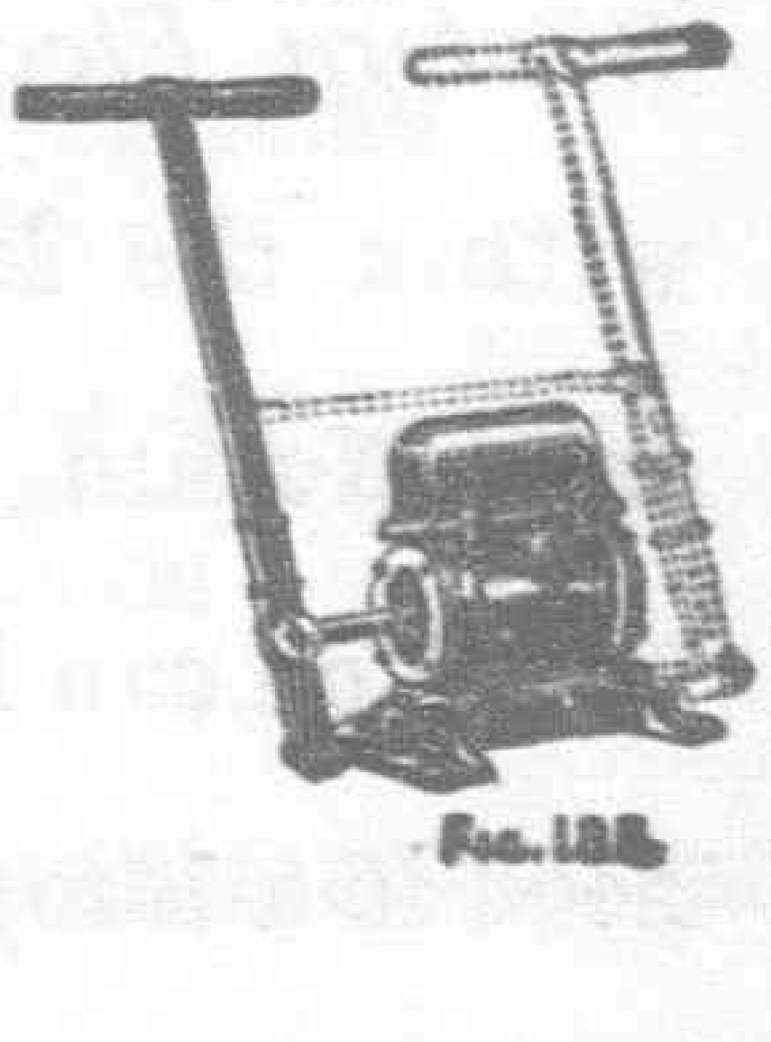


Fig.188.

Starting, Stopping, and Speed Regulation is all controlled by a touch of the toe.

Do Your Sewing the Tireless Way with a **Western Electric** Sewing Machine

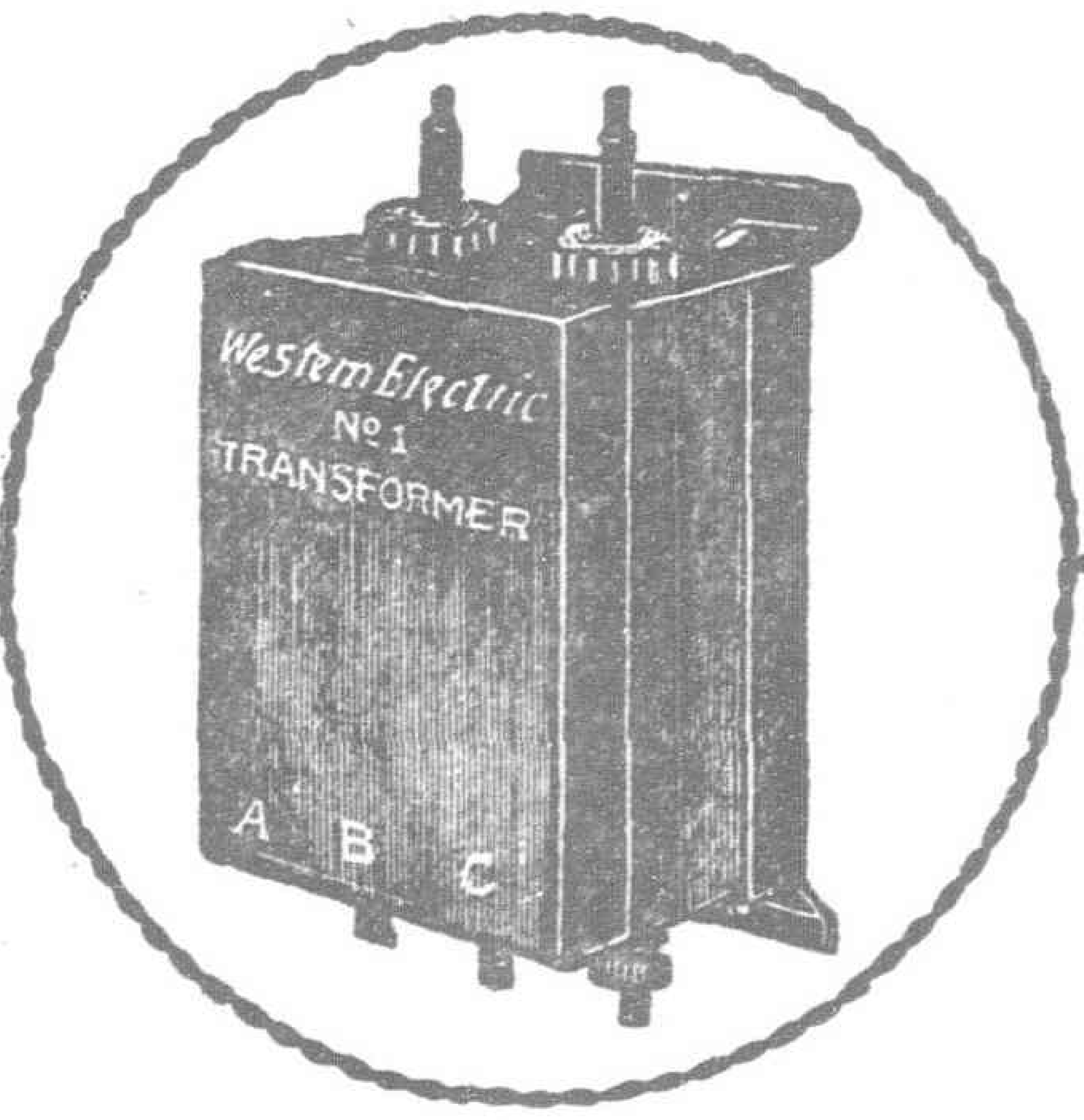
ANY electric light socket in your home will furnish the power needed to run the machine an hour or all day long.

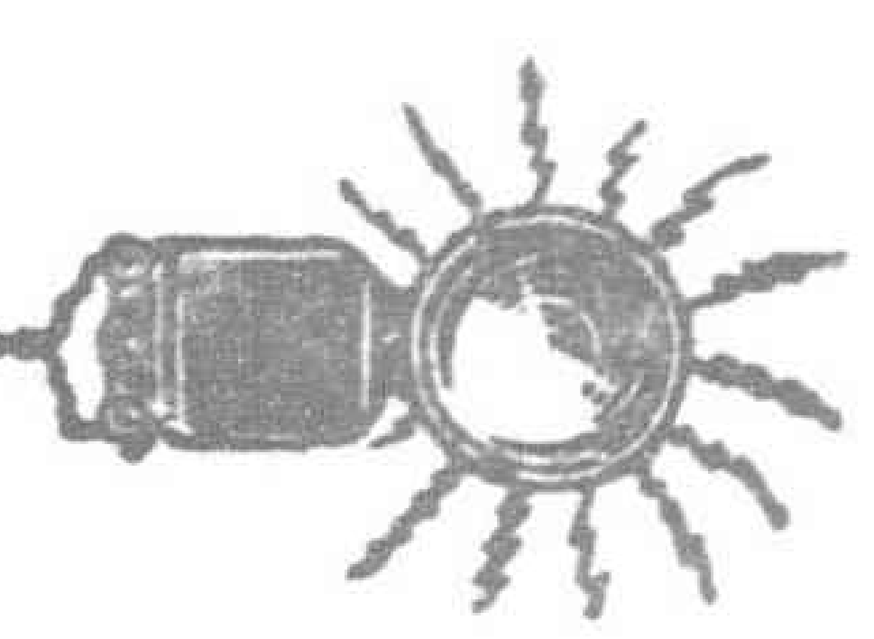
THE *Western Electric* Sewing Machine has an electric motor mounted permanently on the Machine head. No adjustments are necessary.

THE Machine in Carrying Cover is no heavier than a well filled suitcase. It is compact enough to be put away on a shelf or under a couch. The motor operates on either direct or alternating current.

Ring Your Bell the Economical Way through a **Western Electric** Bell Ringing Transformer

THIS is a compact, attractive and inexpensive little device that is used in place of day batteries to operate Bells, Buzzers, and Door-Openers. The amount of current used is so small it will never be noticed.



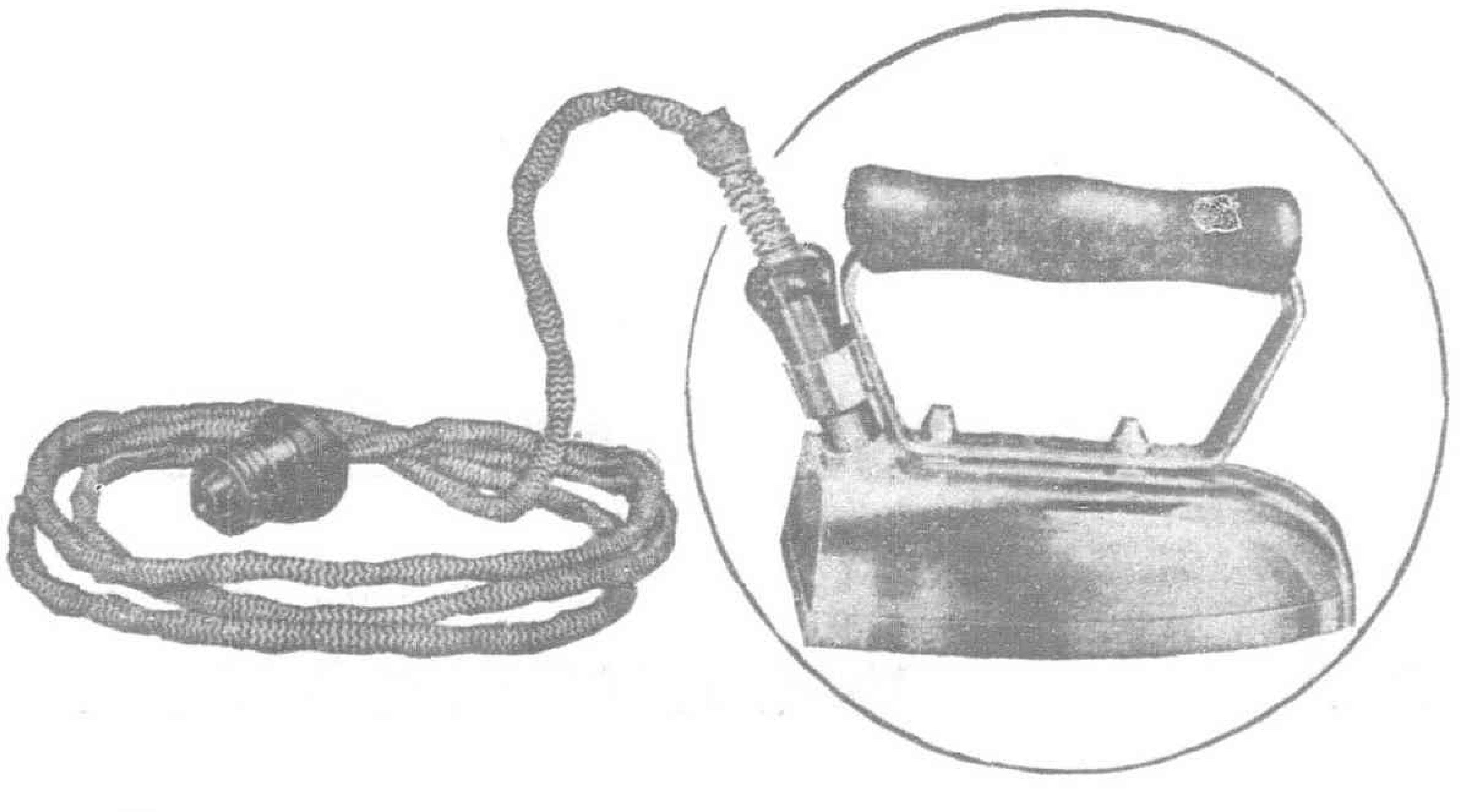


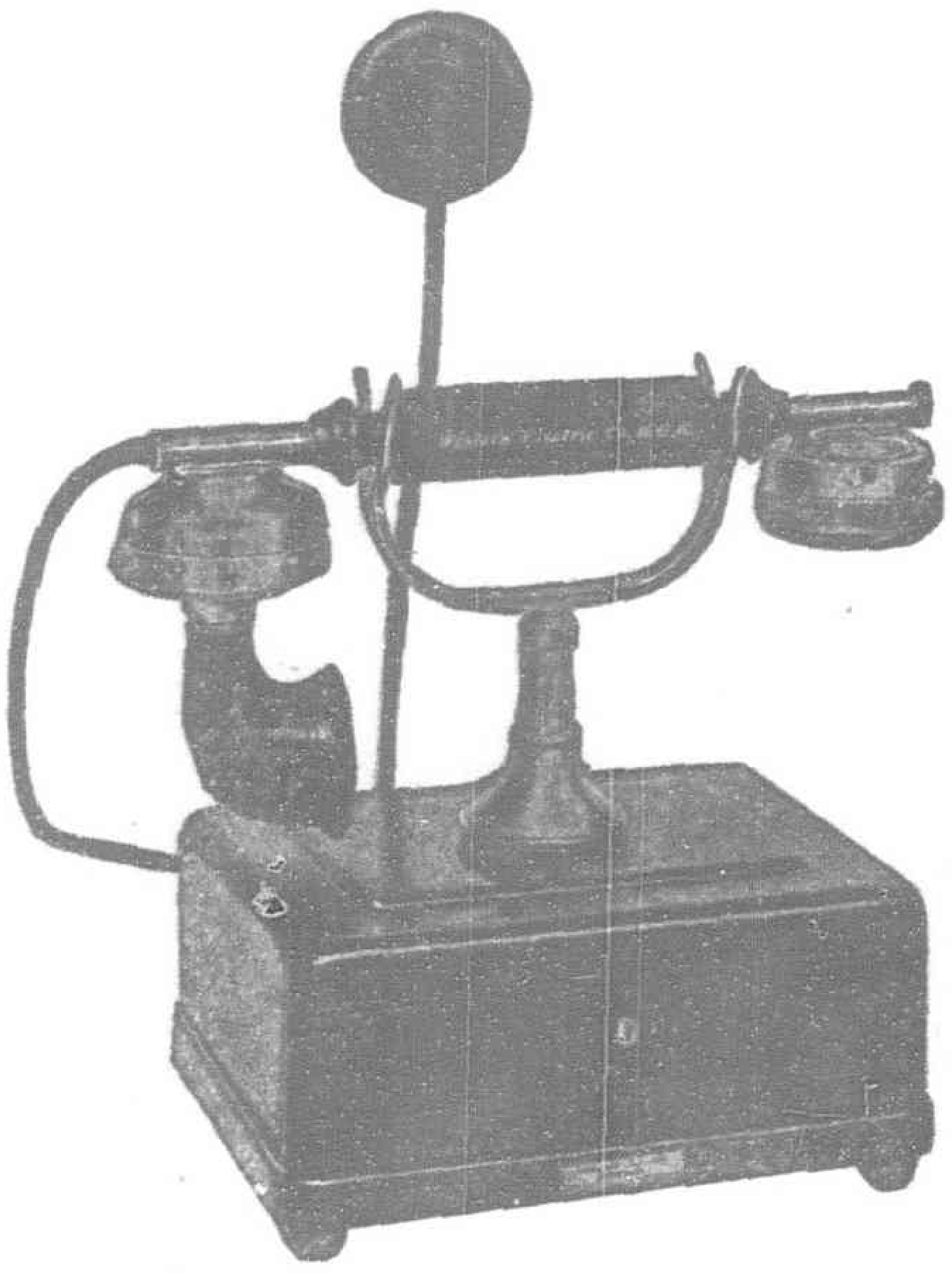
IT is connected to the lighting circuit and reduces the voltage so that your bell will ring every time you press it. There are no moving parts to oil or wear out and nothing to be renewed. It requires no attention and will last indefinitely.

Do Your Ironing the Coolest Way with a **Western Electric** Iron

TO iron in the old-fashioned way means a hot stove and a hot kitchen. A *Western Electric* Iron does away with all this. In the *Western Electric* Iron, electric Wires concealed within the Iron itself generate heat within the Iron. Nothing but the Iron gets hot.

You can iron anywhere in any room. All you need is a lamp socket and a *Western Electric* Iron.





Common Battery Desk Telephone

For 38 years the **Western Electric** Company has supplied the markets of the world over **10,000,000 Telephones** and vast quantities of cable and supplies together with the largest switchboards ever constructed.

Common Battery Wall Telephone

The following common battery telephone exchanges are among the more important systems which have been installed in China by the **Western Electric** Co. Inc.

East Office Exchange—Peking

South Office Exchange—Peking.

Central Office Exchange—Tientsin

Central Office Exchange—Changsha.

MAKE YOUR ENTIRE EQUIPMENT

Western Electric

thus standardizing and simplifying operation and making easier, extension or changes.

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WESTERN ELECTRIC CO., INC.
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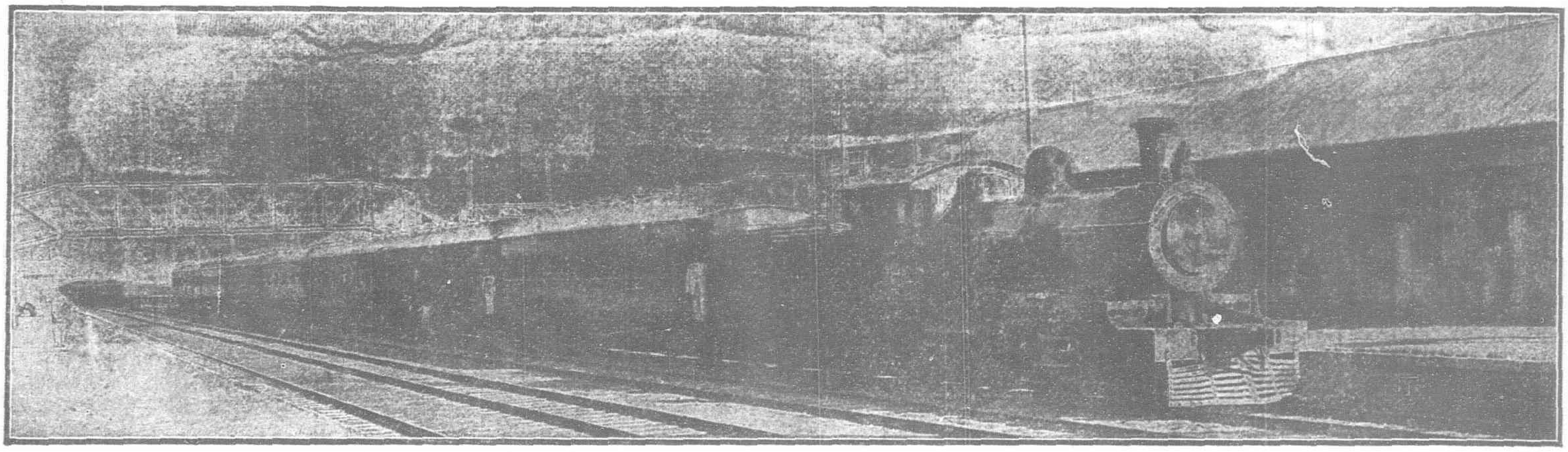
Chinese Government Railways



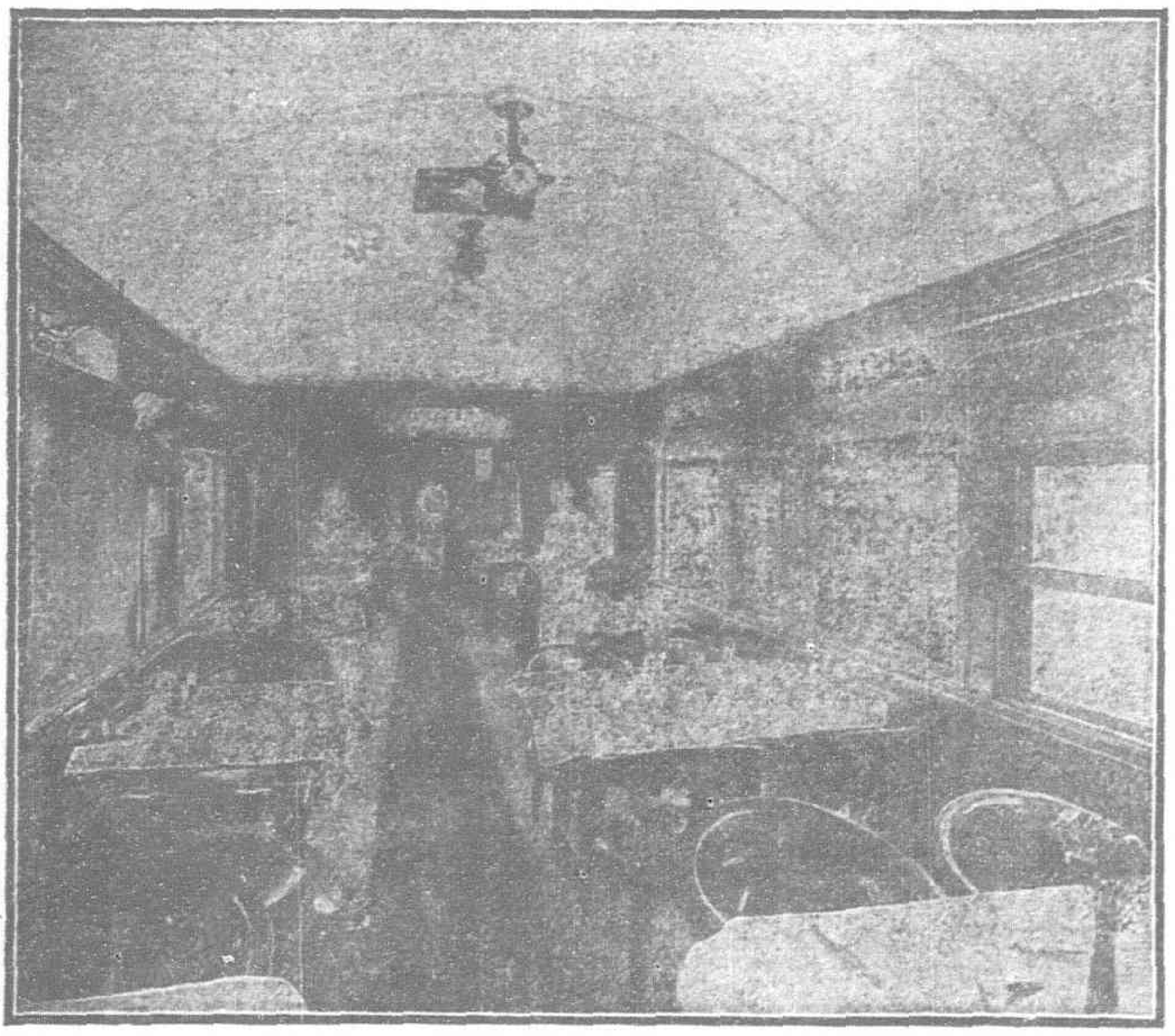
TRAIN DE LUXE AT TIENTSIN EAST STATION

The Peking-Mukden Line

Through service from Peking to Mukden, connecting at Mukden with the South Manchuria Express from Trans-Siberian Route. At Peking connection is made with the Peking-Hankow Railway for Hankow and Yangtze Ports, and Intermediate Points reached by the Chen-Tai Line to Taiyuanfu, the Tao-Ching Line, and the Peinlo Railway to Kaifengfu and Honanfu. Connection is also made at Peking with the picturesque Kalgan Line, "The road to the Great Wall." At Tientsin (Central) connection is also made with the Tientsin-Pukow line for Tsinanfu and Shanghai.

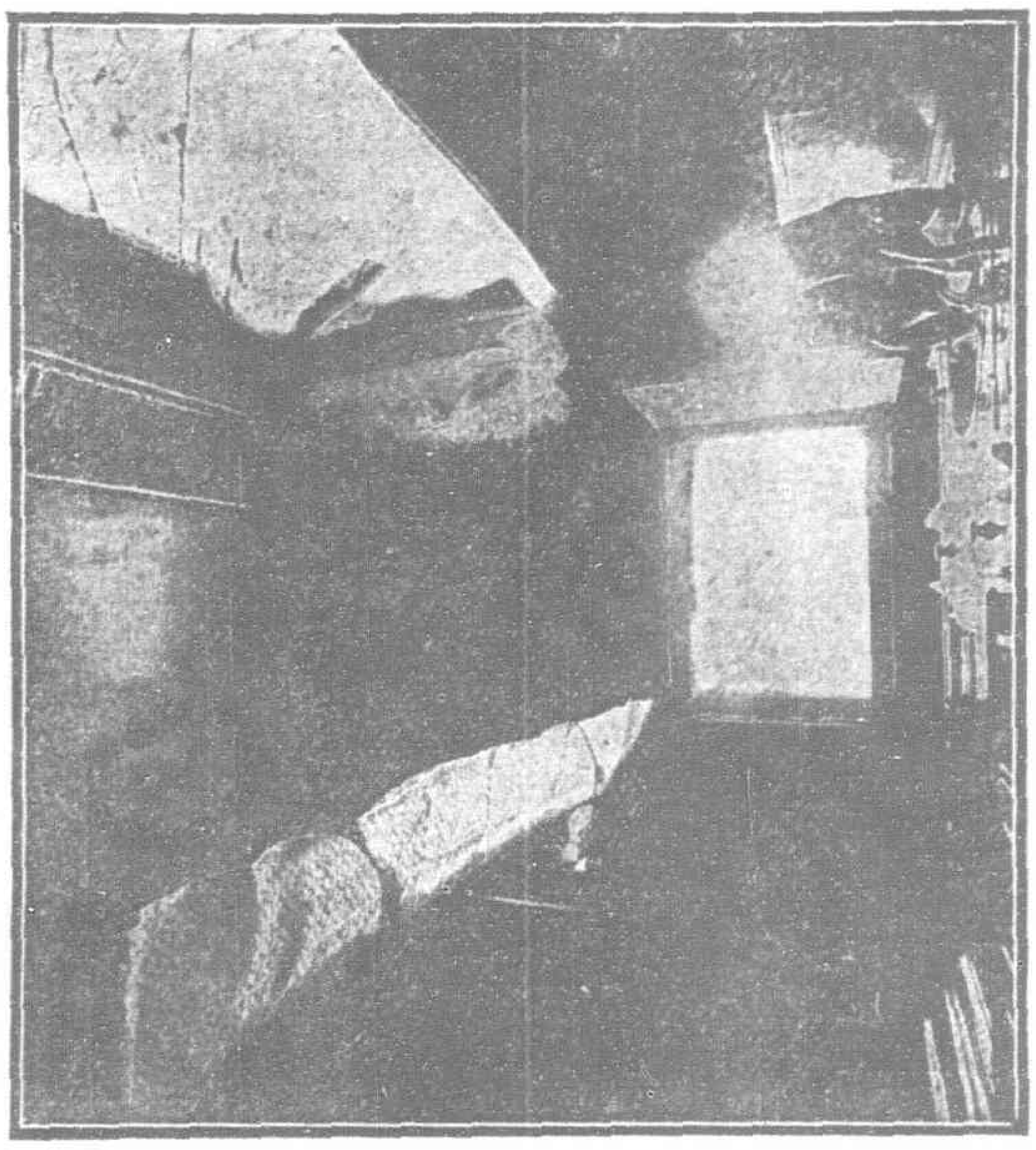
THE RAILWAYS OF NORTH CHINA PASS THROUGH THE MOST INTERESTING PART OF CHINA

PEKING: The Capital, with its Walls, Palaces, Temples and Tombs.—**TIENTSIN:** The Great Trade Center of North China.—**TONGSHAN:** The Largest Mining and Industrial Town in the Country.—**SHANHAIKWAN:** Where the Great Wall ends at the sea.—**NEWCHWANG:** The Busy Commercial Port of Manchuria.—**MUKDEN:** The Ancestral home of the Manchu Dynasty. A Miniature Peking, with its Walls, Imperial Palaces, Temples and Tombs.



DINING CAR ON TRAIN DE LUXE

The through trains are equipped with Buffet and Dining Car Service. A Comfortable, Modern Train De Luxe of Compartment Sleeping Coaches is operated in connection with the through service of the Trans-Siberian and South Manchurian Railways.



FIRST CLASS SLEEPING BERTH, TRAIN DE LUXE

Through tickets to London and other places in Europe can be obtained at Peking and Tientsin from which stations passengers' luggage can be registered through to destination. Through tickets are issued and passengers' baggage registered through between the important Stations on the Peking-Mukden Railway and the South Manchuria Railway, Chosen (Korean) Railway and Imperial Government Railways of Japan.

For information regarding the many places of interest in China, Tourists will find "The Travellers' Handbook for China" with maps most useful. It is obtainable at any of the offices of Thos. Cook & Sons. The Chinese Government Railways Time Table book with Railway map can be had at any of the offices of Thos. Cook & Sons, and the International Sleeping Car Co., Hotels, Clubs and at all important Stations. Full particulars on application to any of the Stations or to the Traffic Manager of any of the Railways mentioned and on application to any office in America, Europe or the Far East of The Cie. International des Wagons-Lits, Thos. Cook & Sons, or

TRAFFIC MANAGER, CHINESE GOVERNMENT RAILWAYS (PEKING-MUKDEN), TIENTSIN.

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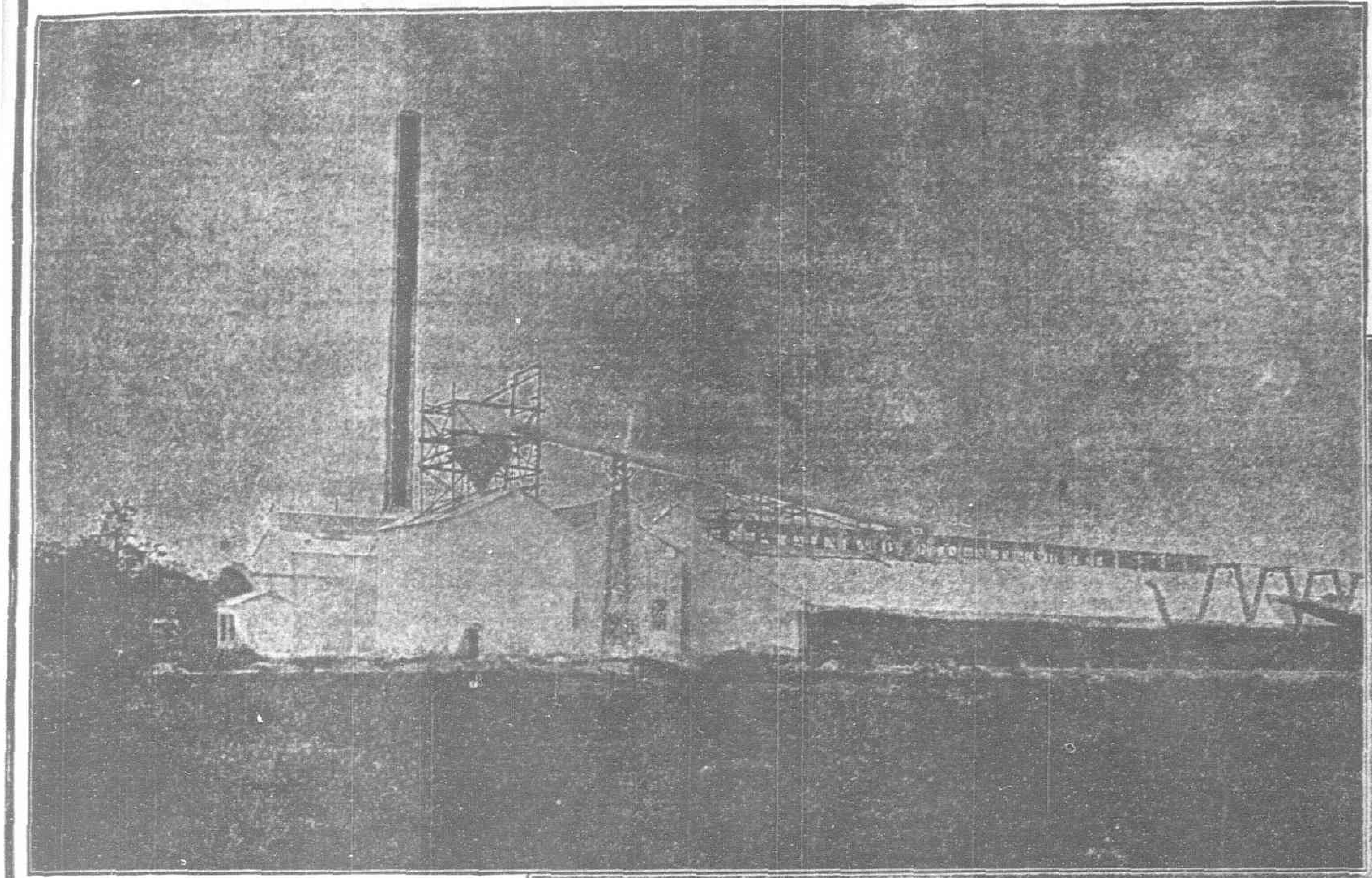
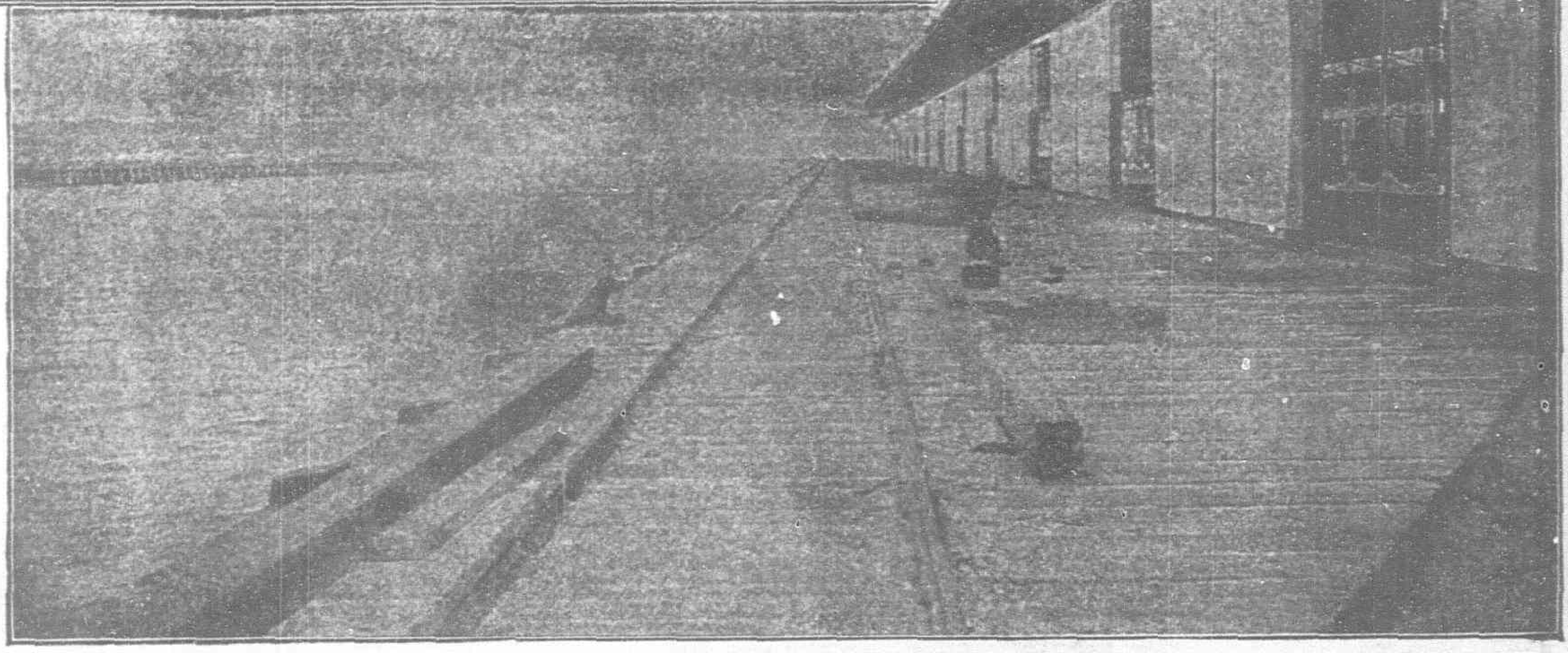
Good For A
Lifetime
Of Service



LUMBER MILL OF CARPENTER & O'BRIEN, JACKSONVILLE, FLORIDA, U.S.A.



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The engineers and officials who planned the great steam lumber mill shown in the upper picture and the eight hundred foot marine dock buildings of the lower had in mind the perils of fire and lightning to such structures and also the continuous attack by the forces of corrosion on ordinary iron and steel in the vicinity of salt water. The result was the choice of galvanized, corrugated Armco Iron.

Because of its unequalled purity and evenness and the scientific care bestowed on every phase of its manufacture

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Resists Rust

and affords a lifetime of service

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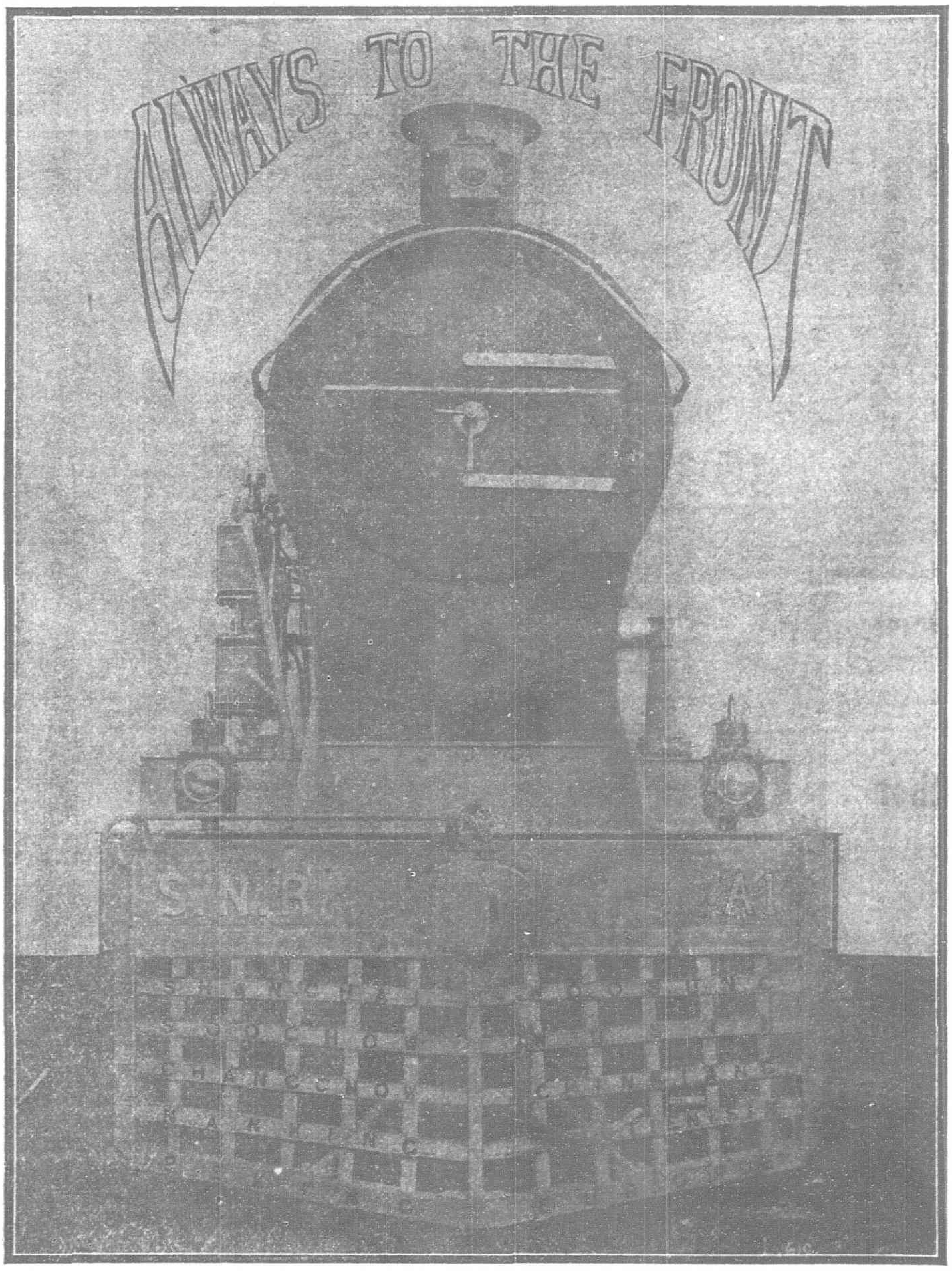
CHINESE GOVERNMENT RAILWAYS
SHANGHAI NANKING RAILWAY



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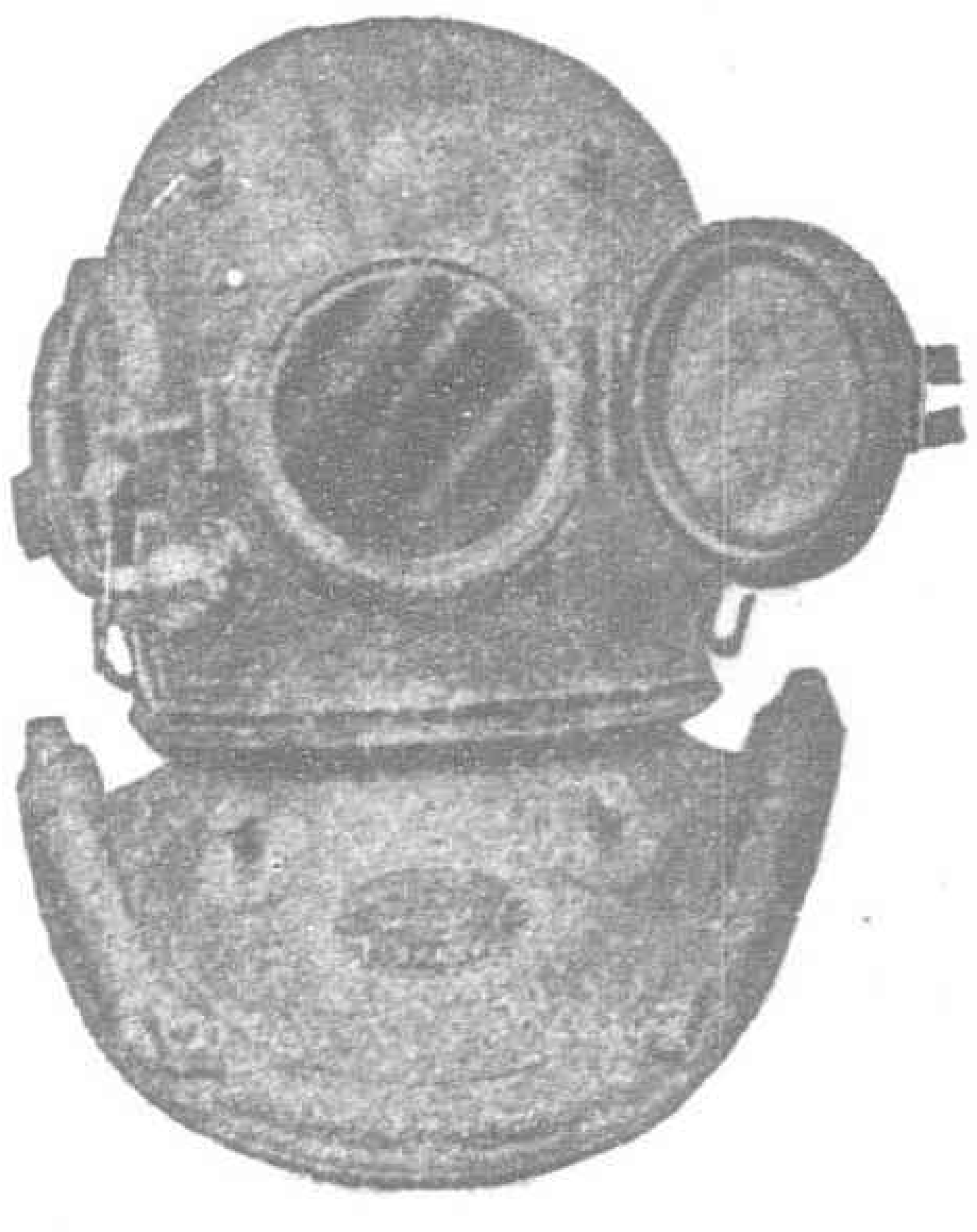

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for Rescue work in mines after explosions, and for use generally in poisonous atmospheres.

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The KENNICOTT TYPE "K" PLANT
OVERCOMES ALL HARD WATER TROUBLES.

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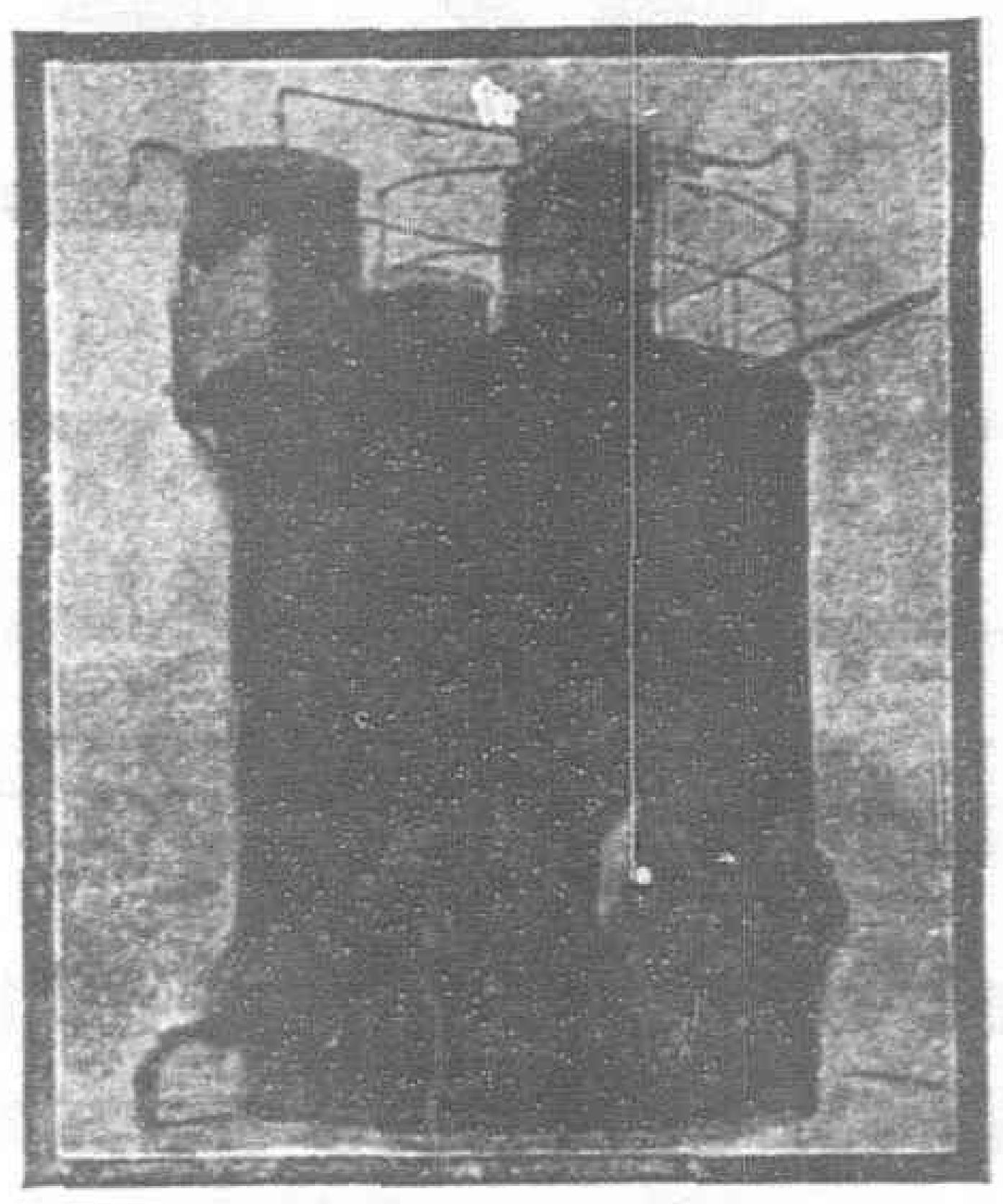

A KENNICOTT WATER SOFTENER AND PURIFIER.

Write for full particulars, sending detailed mineral analysis of water, state maximum requirements per hour, and state for what purpose water is required.

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Largest manufacturers of Water Softening Plant in the World.

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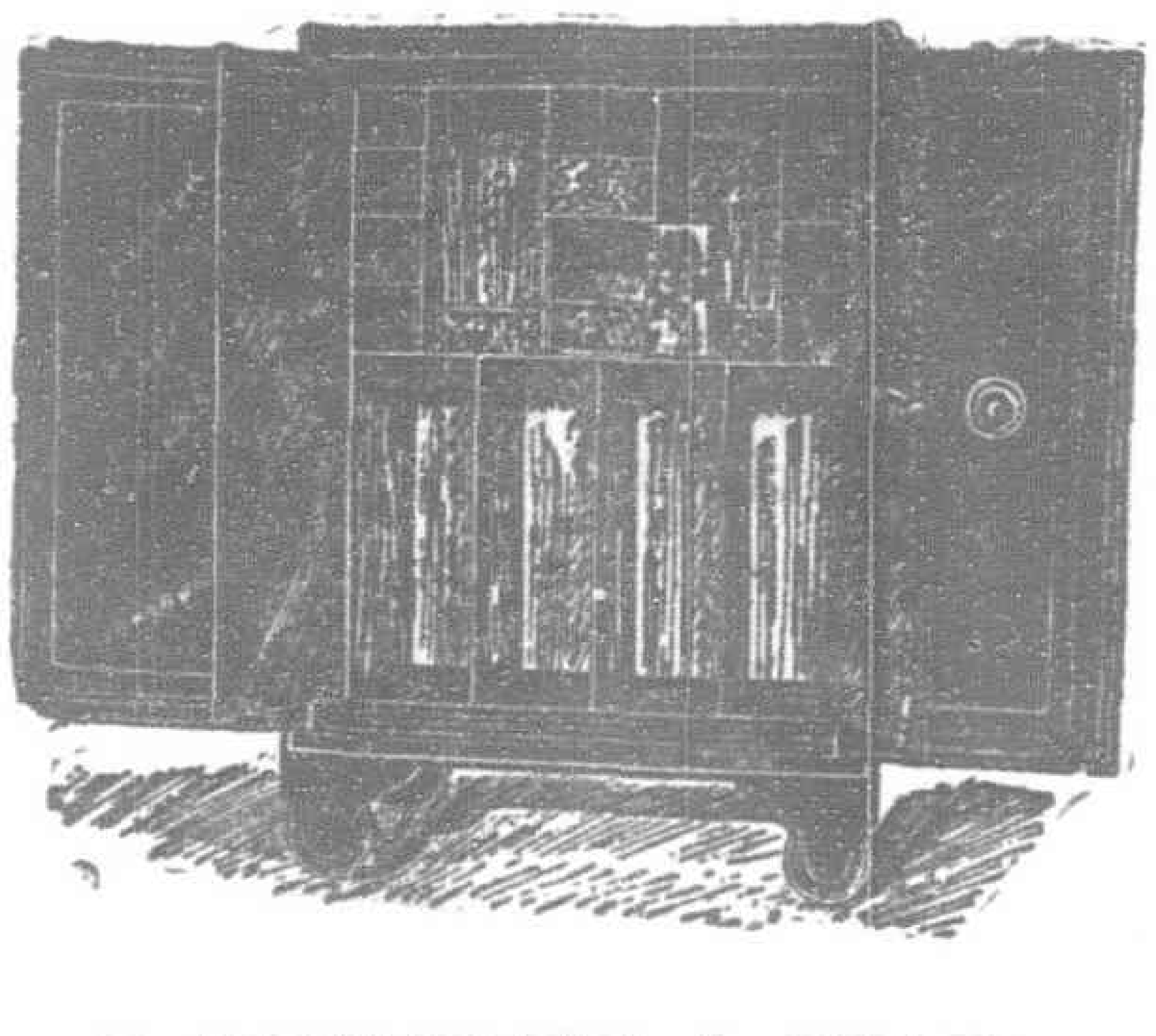
The largest line ever seen in Shanghai.
Now on view at our salesrooms.



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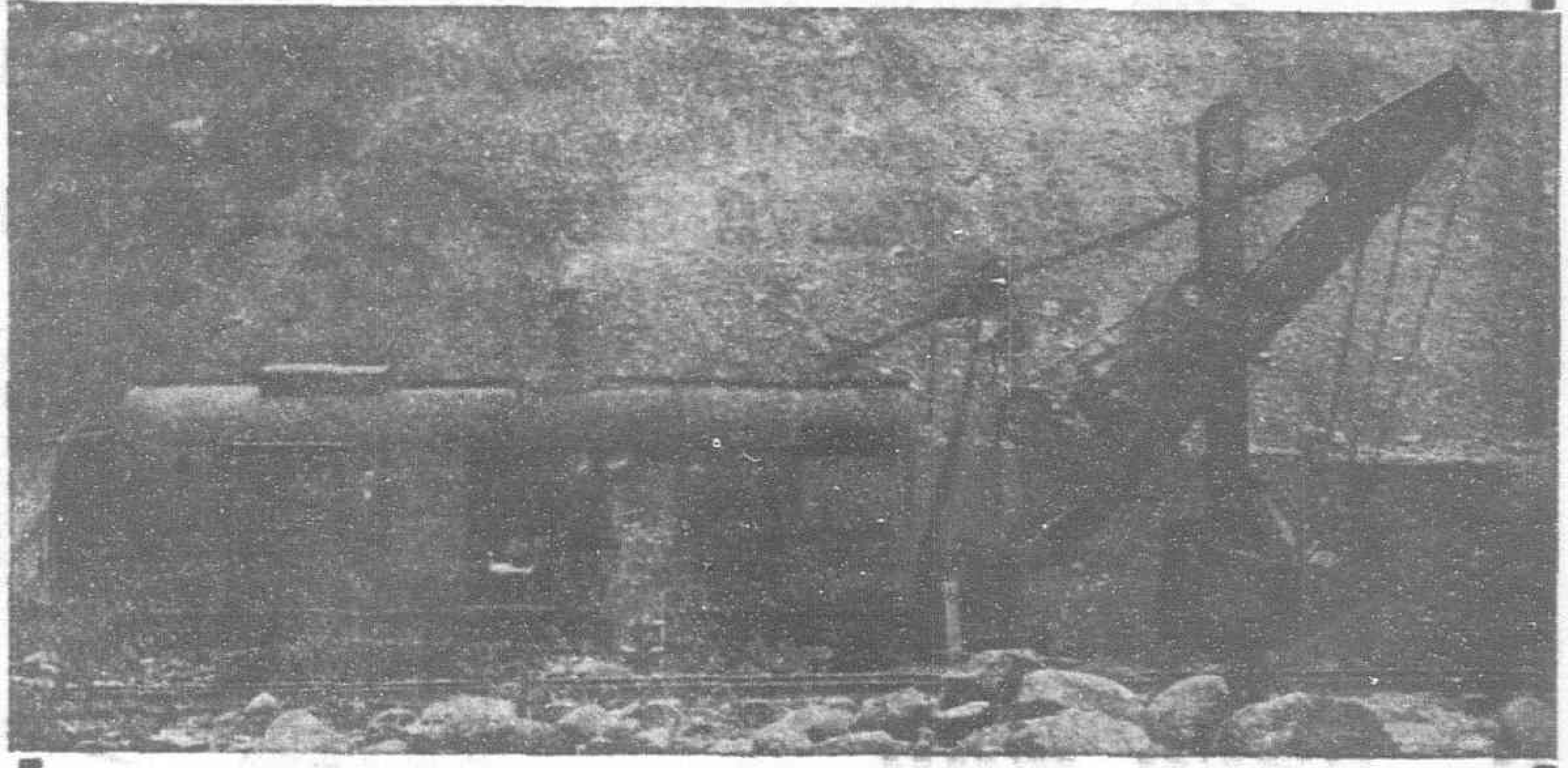
BUCYRUS STEAM SHOVELS



70-C Bucyrus Steam Shovel with 2-½ cubic yard dipper owned by the Finnish Government Railways

BUCYRUS SHOVELS

are used extensively in all sorts of excavating work in the United States and abroad. These machines are particularly well adapted for railway construction work and the mining and stripping of iron, copper, and other similar formations. We include among our installations abroad the following Bucyrus Shovels: **Rio Tinto Co., Ltd., Spain, 17; Trafikaktiebolaget Grangesberg-Oxelosund, Sweden, 23; Chile Exploration Co., Chile, 9; Russian Railways, Russia, 9; South Manchurian Railway, Manchuria, 4; Union Miniere du Haut Katanga, Africa, 6.**

We also build gold dredging machinery, harbour and dipper dredges, steam and electric shovels and dragline excavators of all types and sizes.

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PATENT **VISLOK** PATENT

PATENT

RELIABLE SAFETY LOCK NUT

VISLOK—A SIMPLE VALVE OR TAPPET ADJUSTMENT.

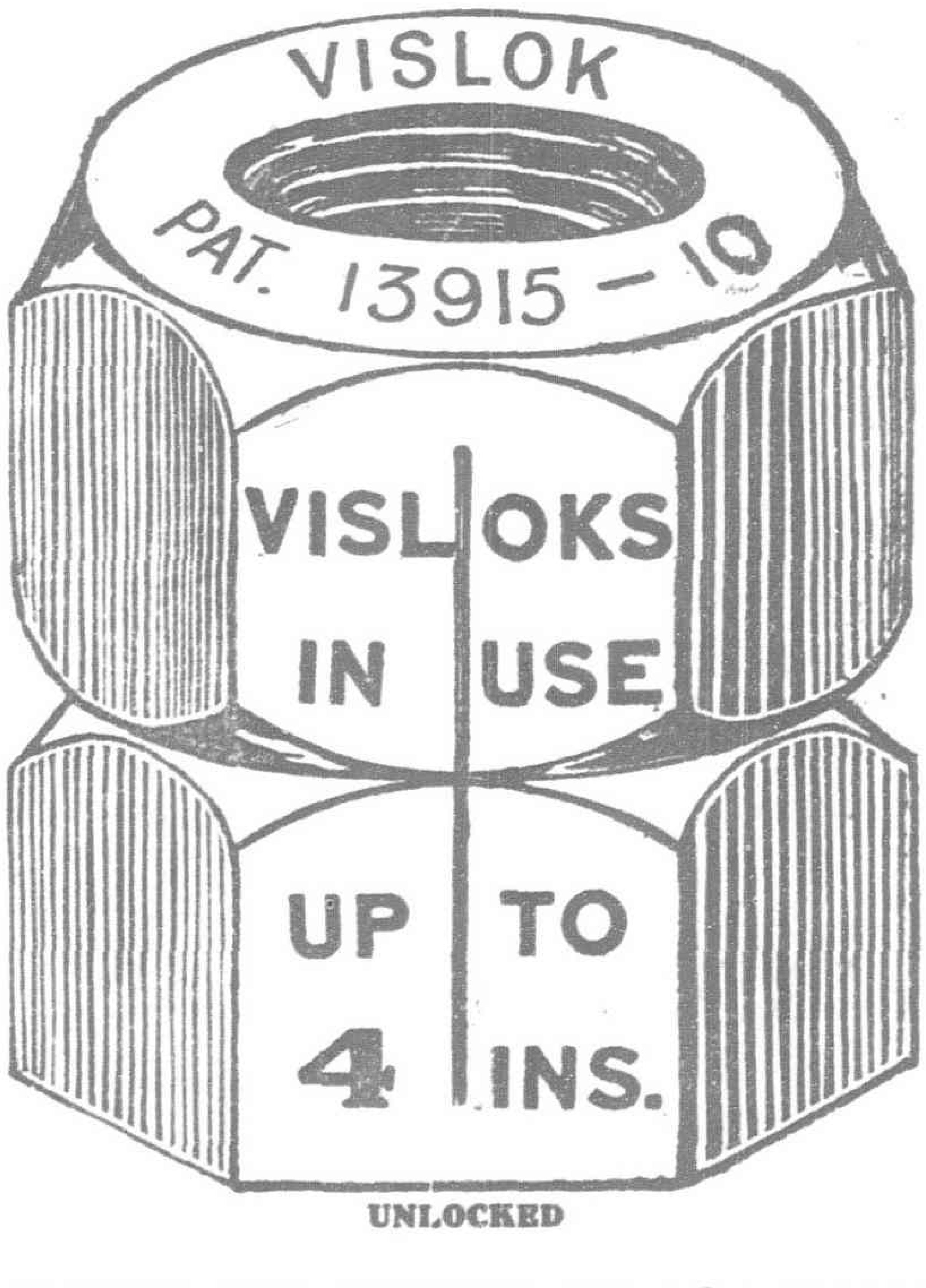
"A set of 'VISLOK' tappet nuts which has seen considerable usage in one of my DORMAN engines seems to overcome all these drawbacks, and is very efficient. IN FACT, I FEEL SURE THE NUTS HAVE NOT BEEN TOUCHED FOR SEVERAL HUNDRED MILES, WHICH IS EXTRAORDINARY WHEN IT IS REMEMBERED THAT IN THIS DISTANCE EACH VISLOK HAS RECEIVED A MILLION OR MORE IMPACTS.

Vislok tappet nut resembles a divided hexagon nut capped but actually consists of two nuts hydraulically pressed together, with a common thread. Vislok is screwed to the valve stem as an ordinary nut, and, when the correct clearance is obtained, is locked by moving out of register the markings that appear on the hexagon faces. To unlock, the markings are brought to register when the Vislok may be simply unscrewed.

The "Vislok" tappet will be found convenient for modernizing ancient mounts, as it is only necessary to remove the valves and thread the stems with a standard die. The "Vislok" then replaces the old valve cotter, and the troublesome task of TAKING UP VALVE GEAR WEAR IS REDUCED TO A FIVE-MINUTE JOB."

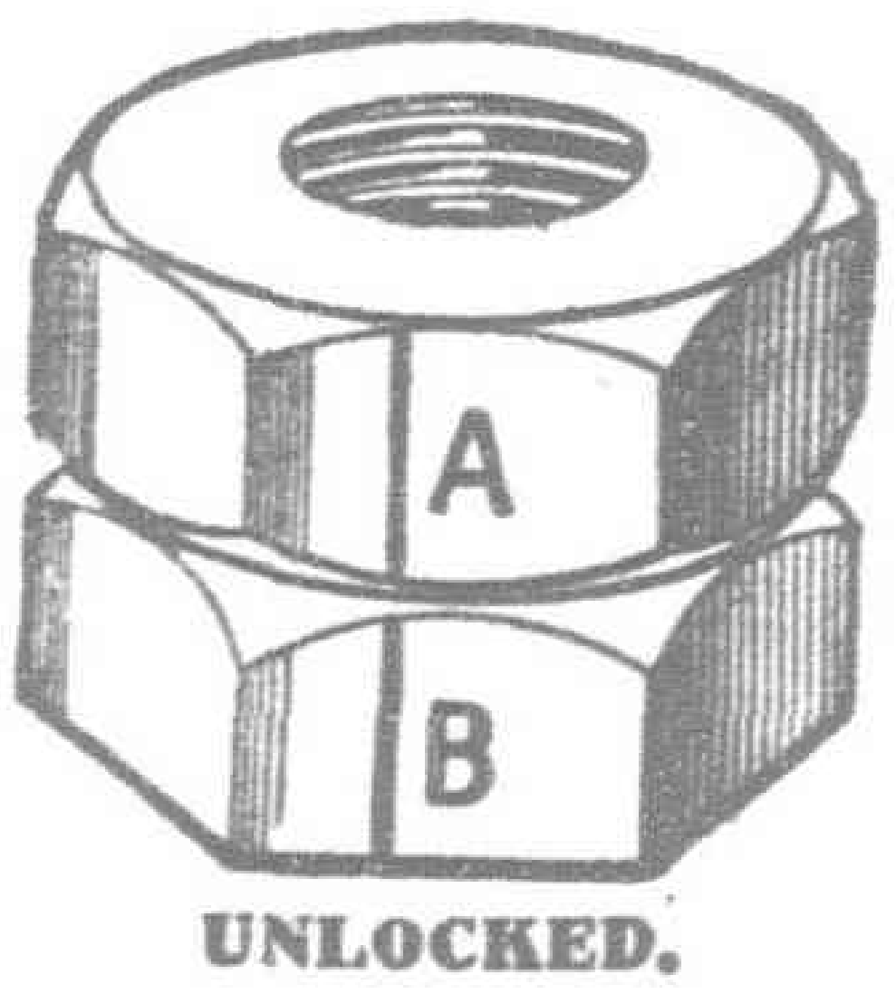
Motor Cycling, Nov. 14, 1916.

VISLOKS have won a Great Mechanical Fight.



UNLOCKED

VISLOKS Unique Record in the Mechanical World.



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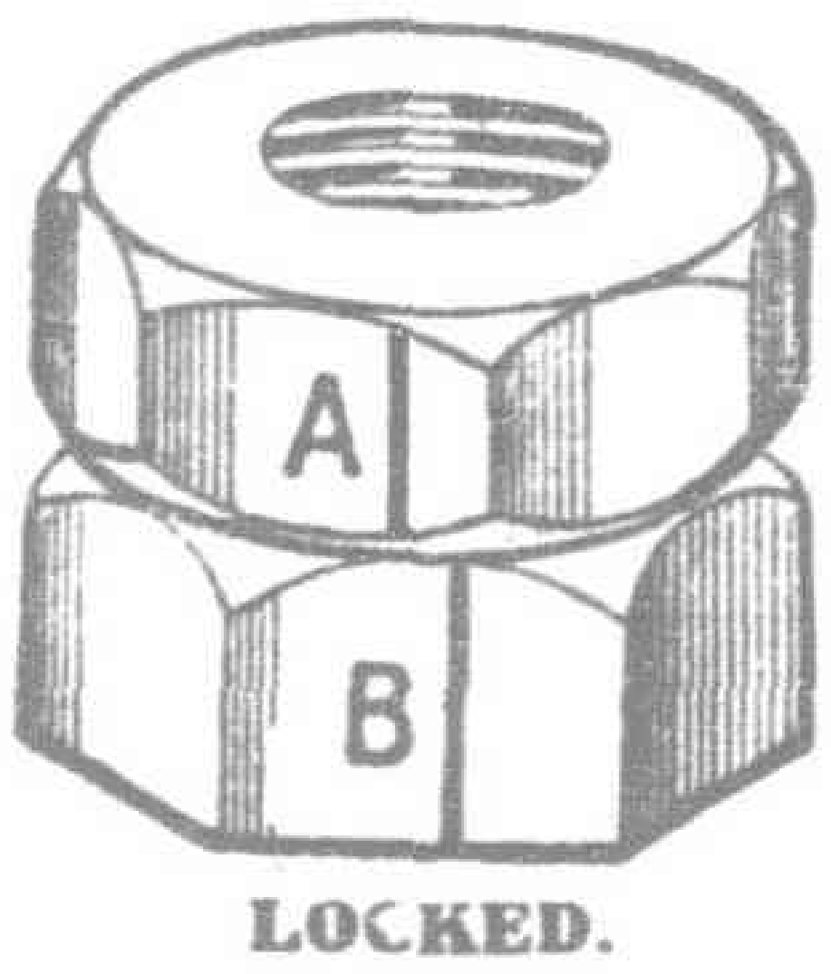
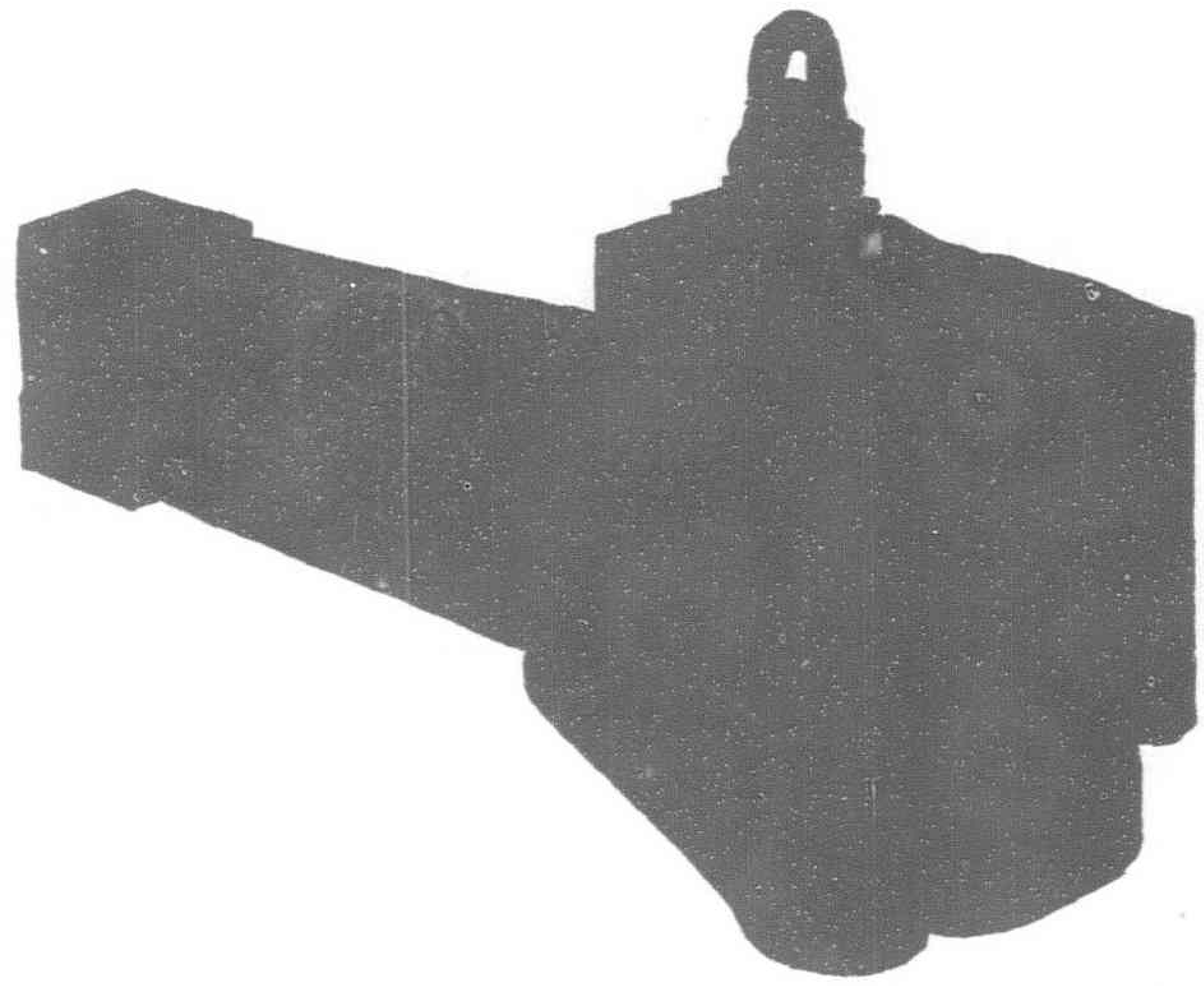


LOCKED.

FREE SAMPLE FOR TESTING ON APPLICATION TO

VISLOK Ltd., 3, ST. BRIDE'S HOUSE, SALISBURY SQUARE FLEET STREET, LONDON, E.C.

The JANNEY-PENN Coupler



THE latest development of the Janney type of M. C. B. Coupling originally introduced and promoted by this company. This coupler has all the simplicity of the early type of the Janney coupler, and also has the up-to-date features of a "Lock-to-the-Lock," "Lock-Set," and a "Knuckle-Opener," and complies fully with all the requirements and recommendations of the M.C.B. Association of the U.S.A.

Lock-To-The-Lock—The locking pin cannot climb, being held in the locked position by a trigger the lower end of which projects into a recess in the coupler head, thus preventing accidental uncoupling.

Lock-Set—Lock setting is accomplished by the locking block resting on a seat on the inside wall of the coupler head when raised to the uncoupling position, from which seat it is dislodged on the closing movement of the knuckle in the act of coupling.

Knuckle-Opener—The knuckle-opener pushes the knuckle open to the fullest range of movement from a fully closed position, or from any partially open position, and its path of movement is such as to insure easy and complete opening of the knuckle.

The lock has an extra large bearing surface in contact with the knuckle in the coupler, being approximately five square inches. No portion of the locking block extends beyond the bottom wall of the coupler.

This coupler has the desirable feature of easy accessibility of parts, thus facilitating the making of repairs.

Manufactured exclusively by

THE McCONWAY & TORLEY CO.

Pittsburgh, Pa., U. S. A.

Cable Address—Torley, Pittsburgh

CHINA AGENTS: Fearon, Daniel & Co., Tientsin, China **Andersen, Meyer & Co., Ltd., Shanghai, China**

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March 18-1919
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THE FAR EASTERN REVIEW
COMMERCE :-: ENGINEERING :-: FINANCE

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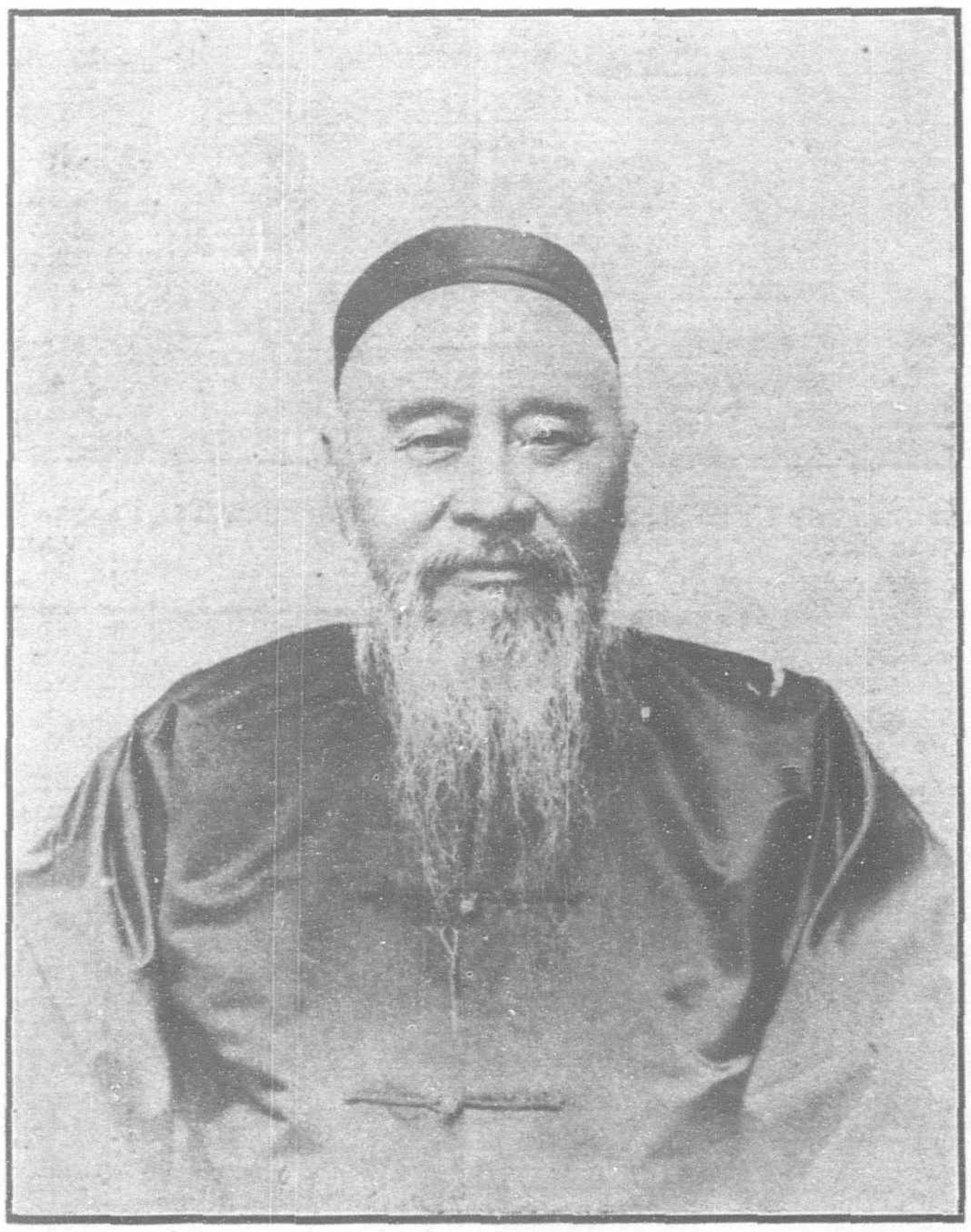
Chinese Plan to Modernize the Tea Trade

New Company Formed to Make Machine Teas and Distribute Them Direct Throughout the World

Countless efforts have been made on the part of foreigners to improve certain commercial products of China and, sad to relate, so many failures have been scored that the Chinese are becoming exceedingly chary of self-appointed advisors. They have found it necessary to test out the foreign methods under Chinese conditions of operation until they are assured a reasonable likelihood of success. Perhaps no industry has had more critics and would-be reformers than the manufacture of tea; but in this instance it has remained for the Chinese themselves to seek out the way and make the preliminary experiments until the China Tea Company has been formed to place pure China teas on the European and American markets in the original package, this being the solution worked out for the problem of how to save one of China's greatest industries.

For forty years and more the leading tea hongs of China have seen their trade with Europe and America gradually dwindling and prices falling, until China, cradle of the tea plant and first to spread the fame of the cup that cheers but does not inebriate, has come to realize that the end of that trade in which she once held supremacy is a matter of a few decades at best unless determined action is taken to revive it. That this condition does not appeal to the members of the China tea guilds, who have devoted their lives to the study of this plant and its marketing, goes without saying, for the tea trade is a highly technical business, and a knowledge of tea an asset possessed by only a few hundred men in all the four hundred million inhabitants of Cathay, and they do not wish, like Othello, to find their occupation gone.



MR. TONG A-WEI, ONE OF CHINA'S GRAND OLD MEN WHO HAS BEEN IN THE TEA TRADE FOR SIXTY YEARS AND NOW, AGED EIGHTY, SEES HIS DESCENDANTS APPLYING MODERN METHODS TO SAVE INDUSTRY HE BUILT UP

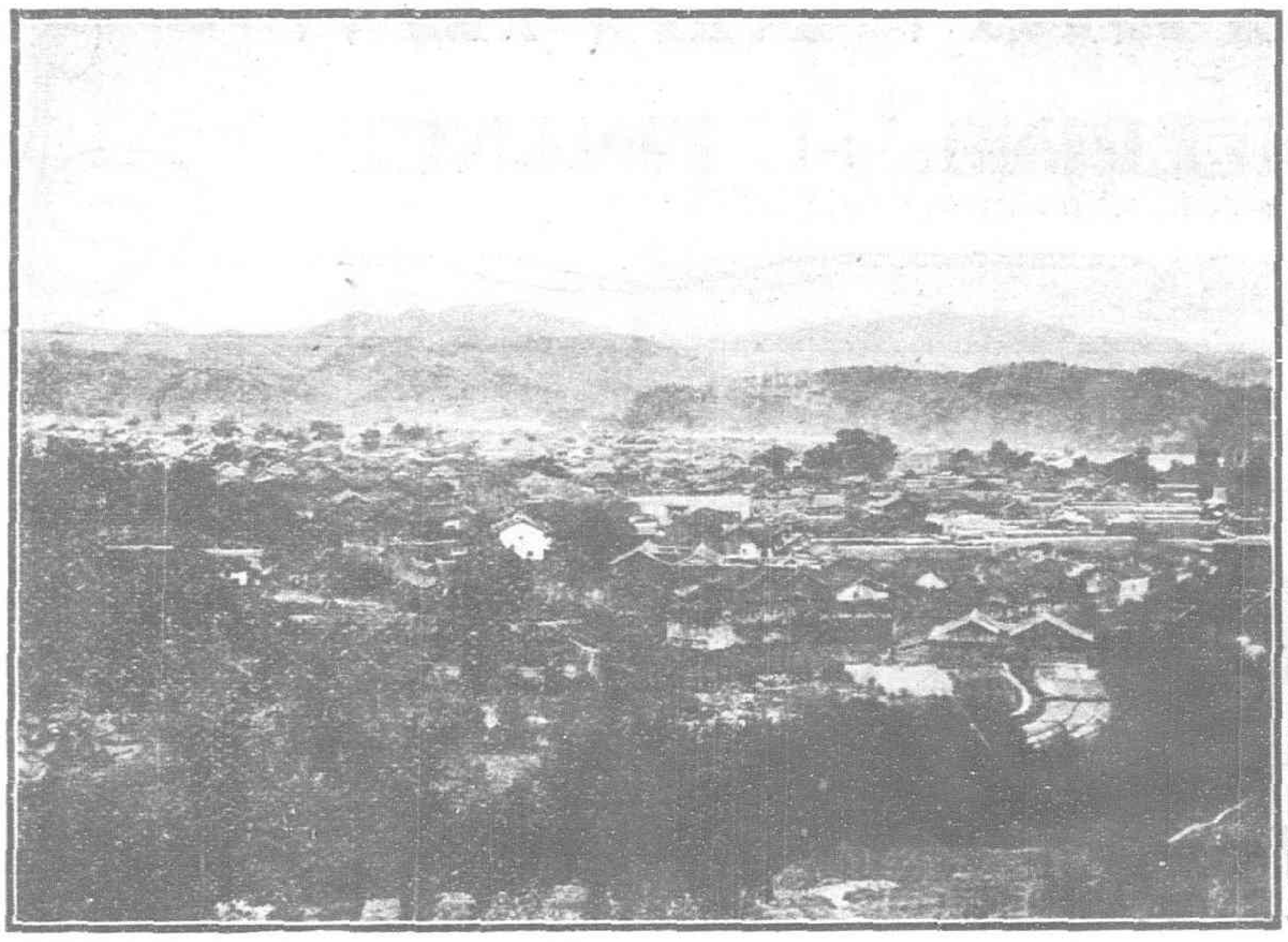
Until the thirteenth century, China had an absolute monopoly of the growing of tea on a plantation scale, and for five hundred years before that time had been imposing a tax on its production. In that century a Japanese priest transplanted tea seeds to Kyushu. the southernmost island of Japan, from which the cultivation gradually extended as far as 39° north latitude. Until well into the nineteenth century, China and Japan remained the only tea producers. In 1826, the Dutch succeeded in growing tea in Java, and ten years later the first pound of Indian tea was brought to London from a plantation in Assam. Attempts to grow tea in Ceylon did not meet with success until 1876, since which time the industry has grown enormously and with great rapidity in both India and Ceylon. The period between 1881 and 1885 is typical of the inroads that India and Ceylon were making in the China tea trade of Great Britain, as the following table of imports giving the number of short tons of 2,000 pounds imported from the producing districts shows:

	India	*Ceylon*
1881	22,717	86
1882	26,788	253
1883	29,626	1,003
1884	31,604	1,105
1885	31,897	2,121

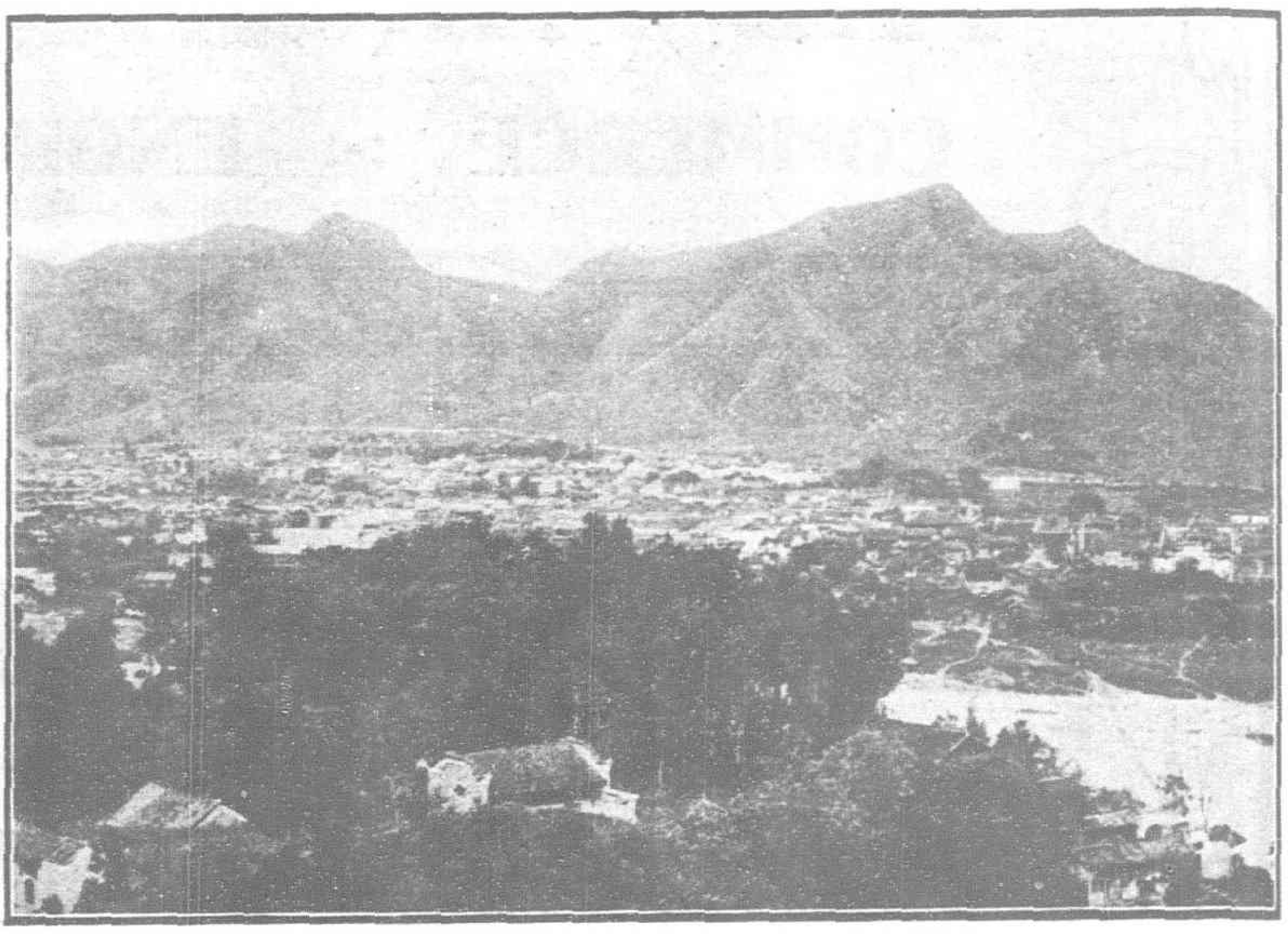
	China	*Hongkong*	*Total*
1881	75,874	5,222	104,900
1882	71,353	5,410	105,331
1883	72,624	5,432	111,131
1884	67,148	4,706	106,939
1885	65,617	4,177	106,071

As these figures cover a period before the advent of the small package teas the inroads of Ceylon and Indian teas, to say nothing of those from Japan, have increased remarkably and in the past three years, China's total export of both black and green teas, leaving out of account the brick teas which are free from competition as yet, was only 64,372 short tons, which is less than the amount purchased from China by Great Britain alone in 1885.

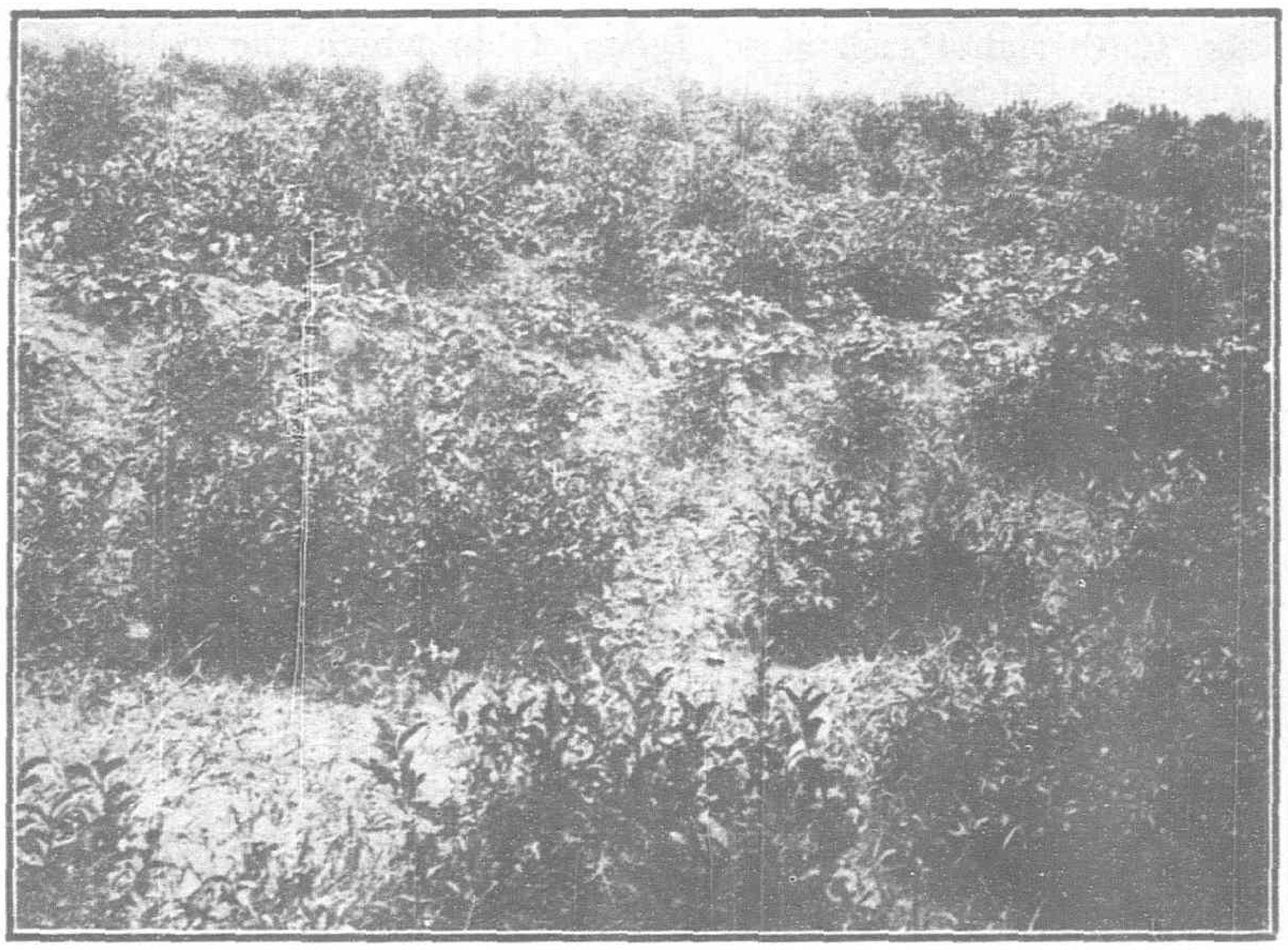
Views of The Ningchow Tea Plantations, Limited



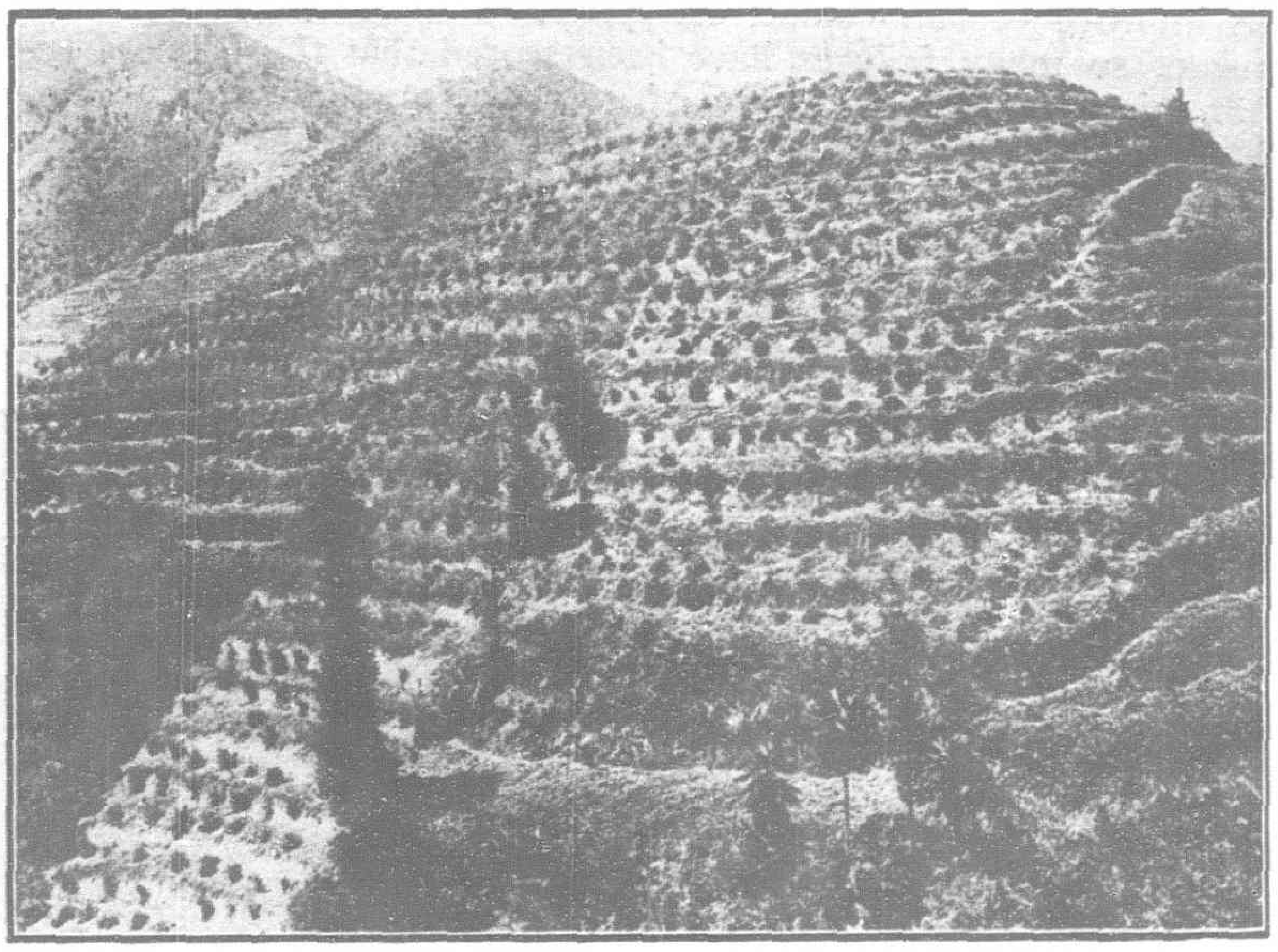
View of Ningchow Showing Site of Plantation Along the Foothills in Background



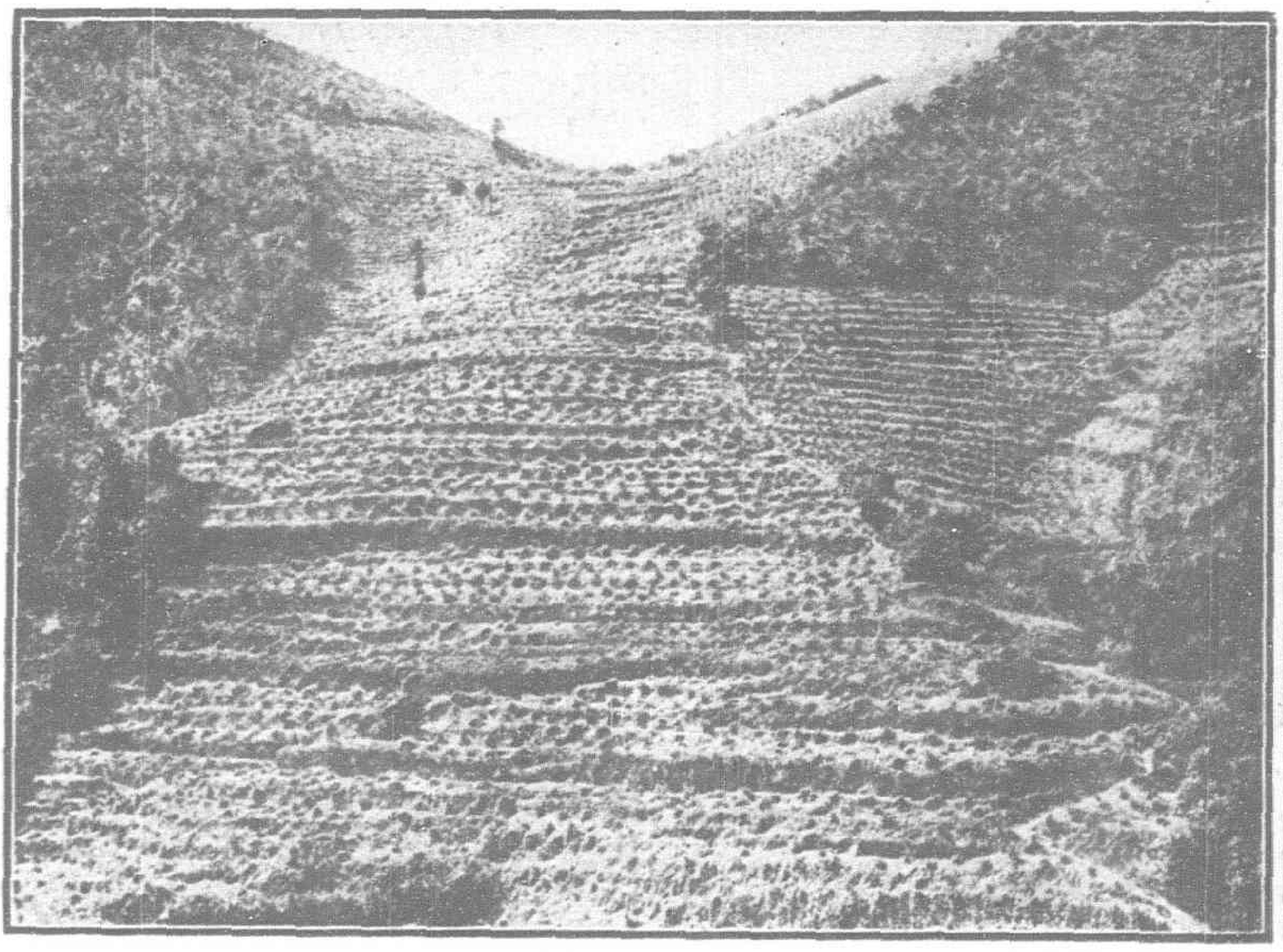
View of Ningchow Showing Site of Plantation on Higher Level of Mountains



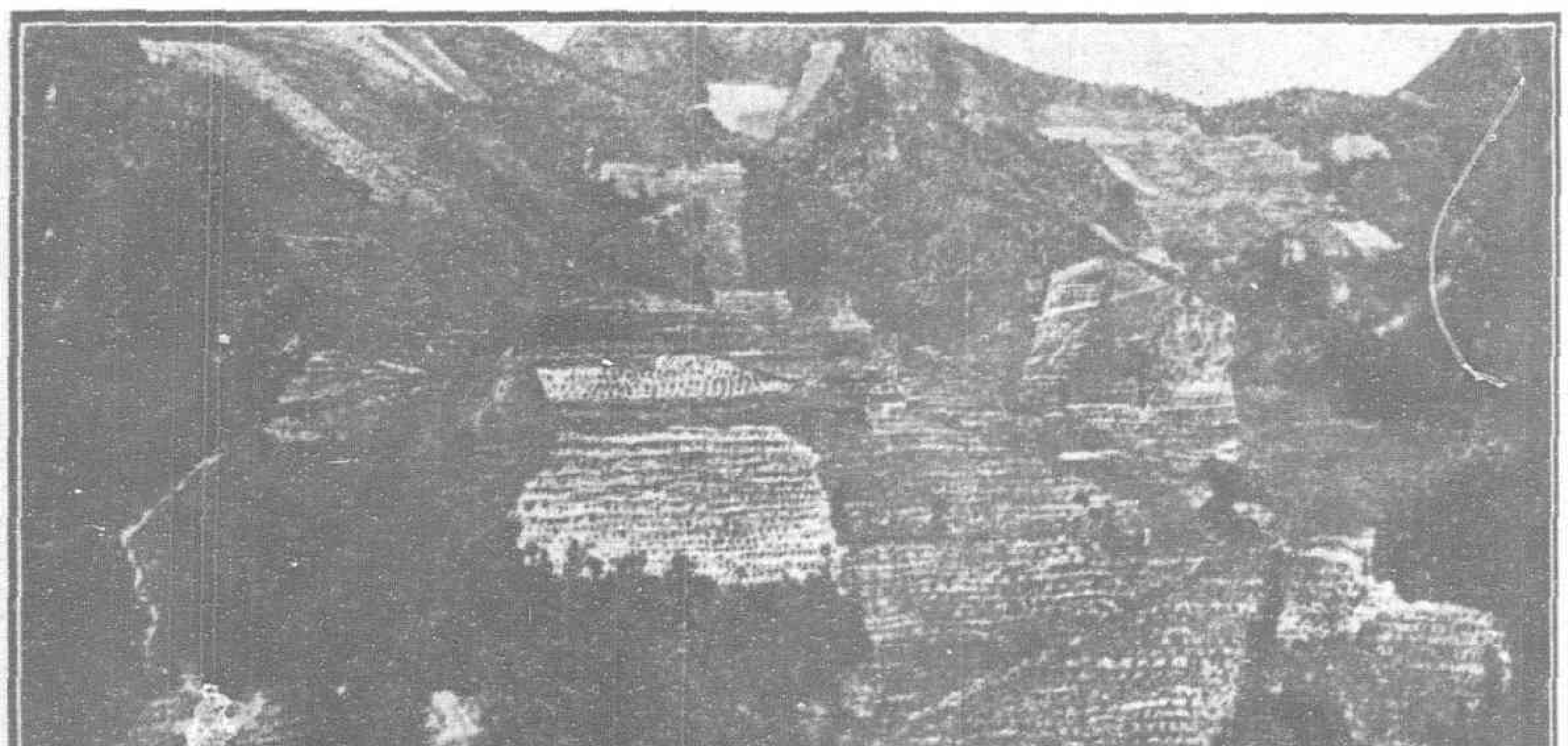
Old Plantation Not Yet Cleared and Brought Up to Modern Standard of Cultivation



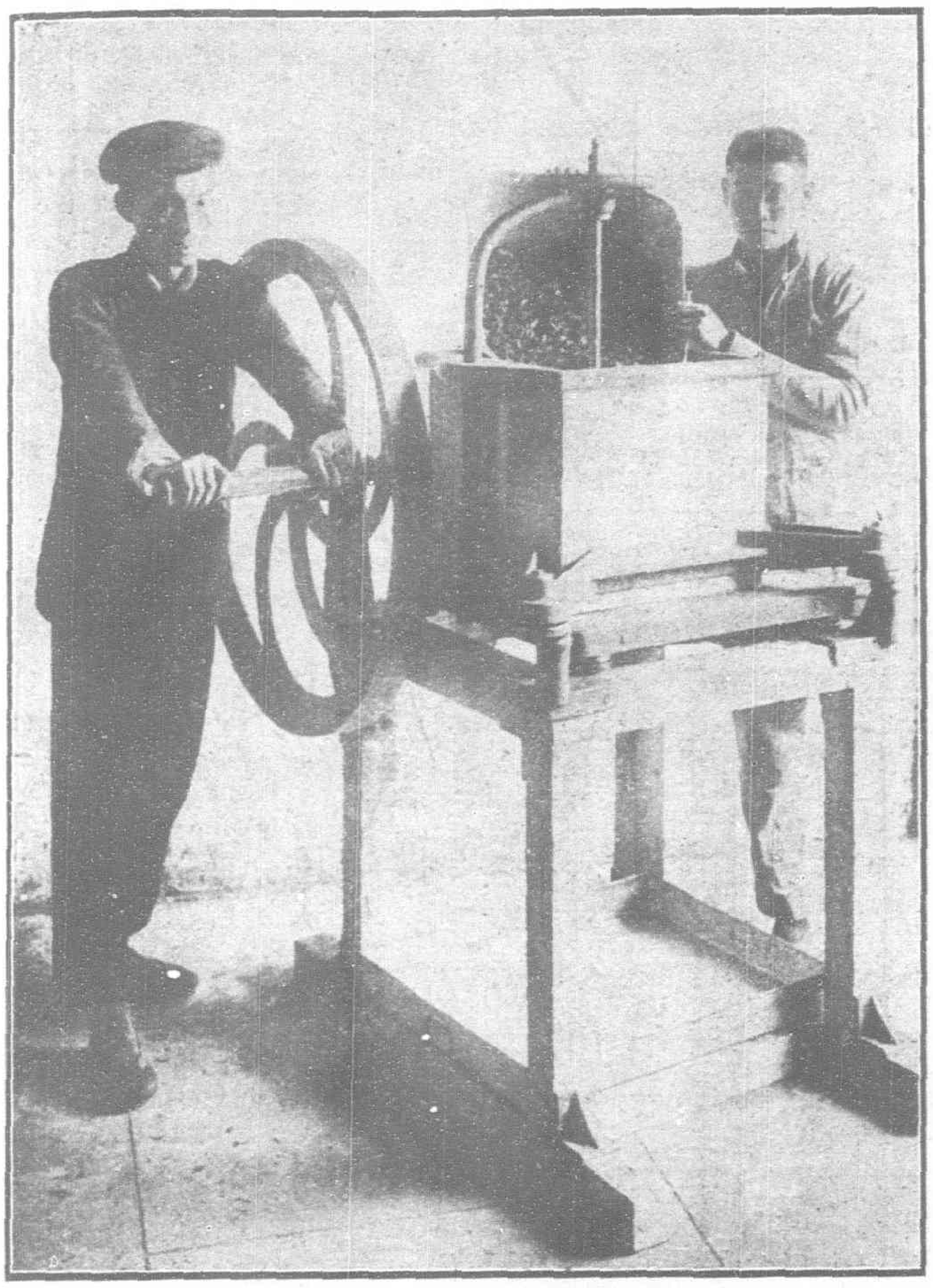
Ningchow Tea Plantations Showing Terracing of Hillside and Drainage Lines



View of Section of New Plantations Where New Tea Bushes Have Been Set Out



General View of New Plantings of Ningchow Tea Plantations



Early Model of Tea Rolling Device

Advertised Out of Market

The Chinese say that China tea is being advertised out of existence—not their advertising, but that of the other fellow, the Ceylon, Indian, and Japanese grower. Now they propose to take a leaf out of their competitors' book and a hair of the dog that bit them, to advertise it back into favor again. The quality of well made China tea is superior to any other in the world, but unfortunately the world does not know it, nor have the Chinese ever given the world a chance to get acquainted with their tea at first hand so to speak, in the individual package, but only through the medium of the huge chest with its lead lining, which the British and American small boys used to "covet" from the grocer,—the box for kite sticks and the lead for bullets.

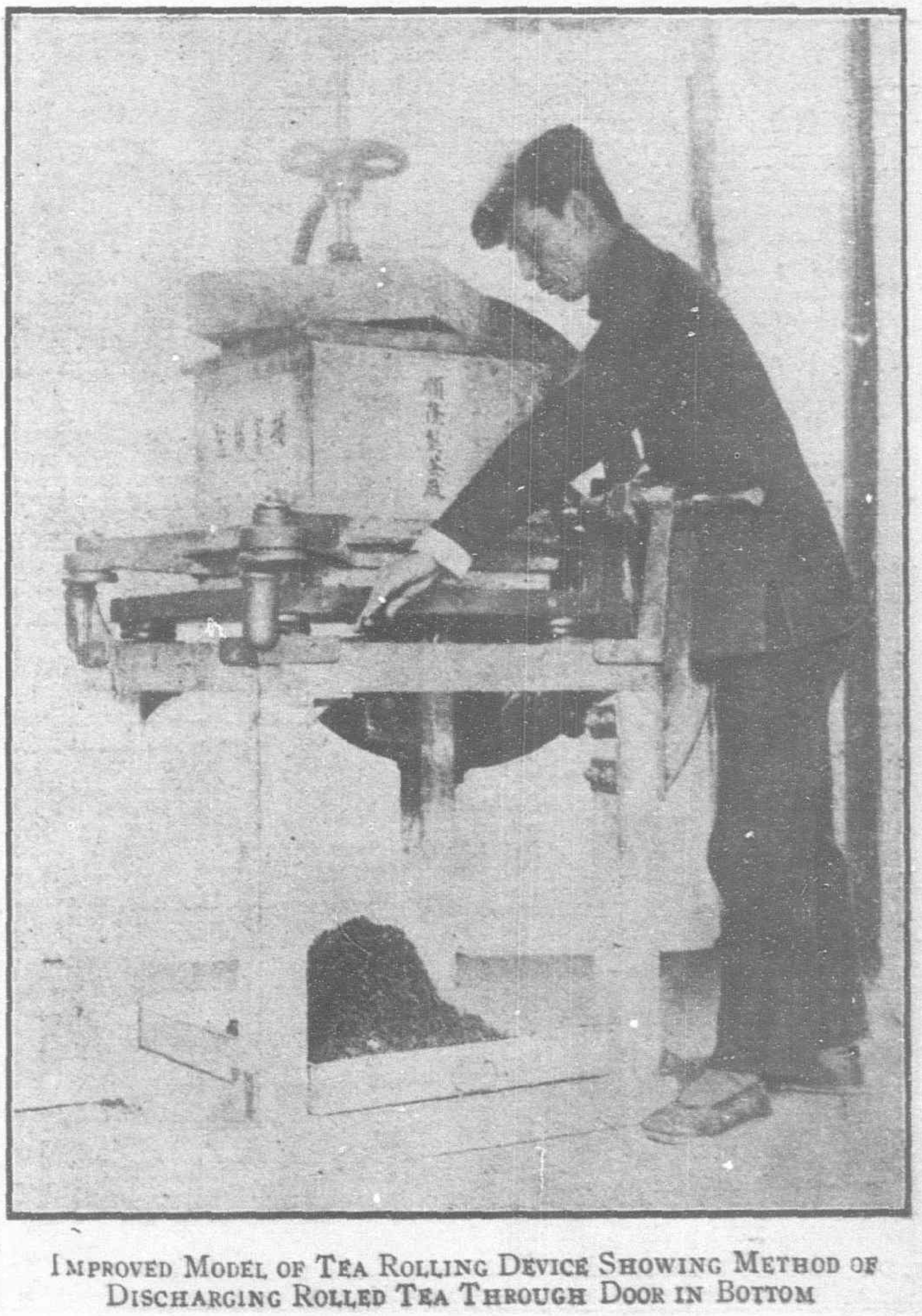
To remedy both these defects the China Tea Company, a purely Chinese concern, has been organized by Chinese tea merchants of long experience whose object is to place pure Chinese tea upon the European and American markets in the original package. The formation of this company is the outgrowth of many years' experience and experiments on the part of the Him Shun On Tea Hong of Shanghai, which was established in 1868 by Mr. Tong Awei, whose sons and nephews are among the principal stockholders, not only in the new tea company but in the Ningchow Tea Plantations, whose product the company will export.

To search out the cause of this falling off in China's tea trade was not difficult, but to prescribe a remedy and that one which could be applied in China was not so easy. For some fourteen years, the Him Shun On Hong has devoted all its energies, and much time and money has been spent until it has determined, so far as its own business is concerned, to strike at the root of the matter and market its own teas, grown on its own plantations and manufactured entirely by its own machinery; so that every leaf, so far as it can be grown and made ready for market, will be exactly like every other leaf and at that of the highest possible quality. To this end the tea and planting companies have set apart a capitalization adequate not only for the growing, but for the ultimate marketing and placing of the tea in the hands of the consumer, or at least the wholesale grocer through whom the consumer most readily can be supplied.

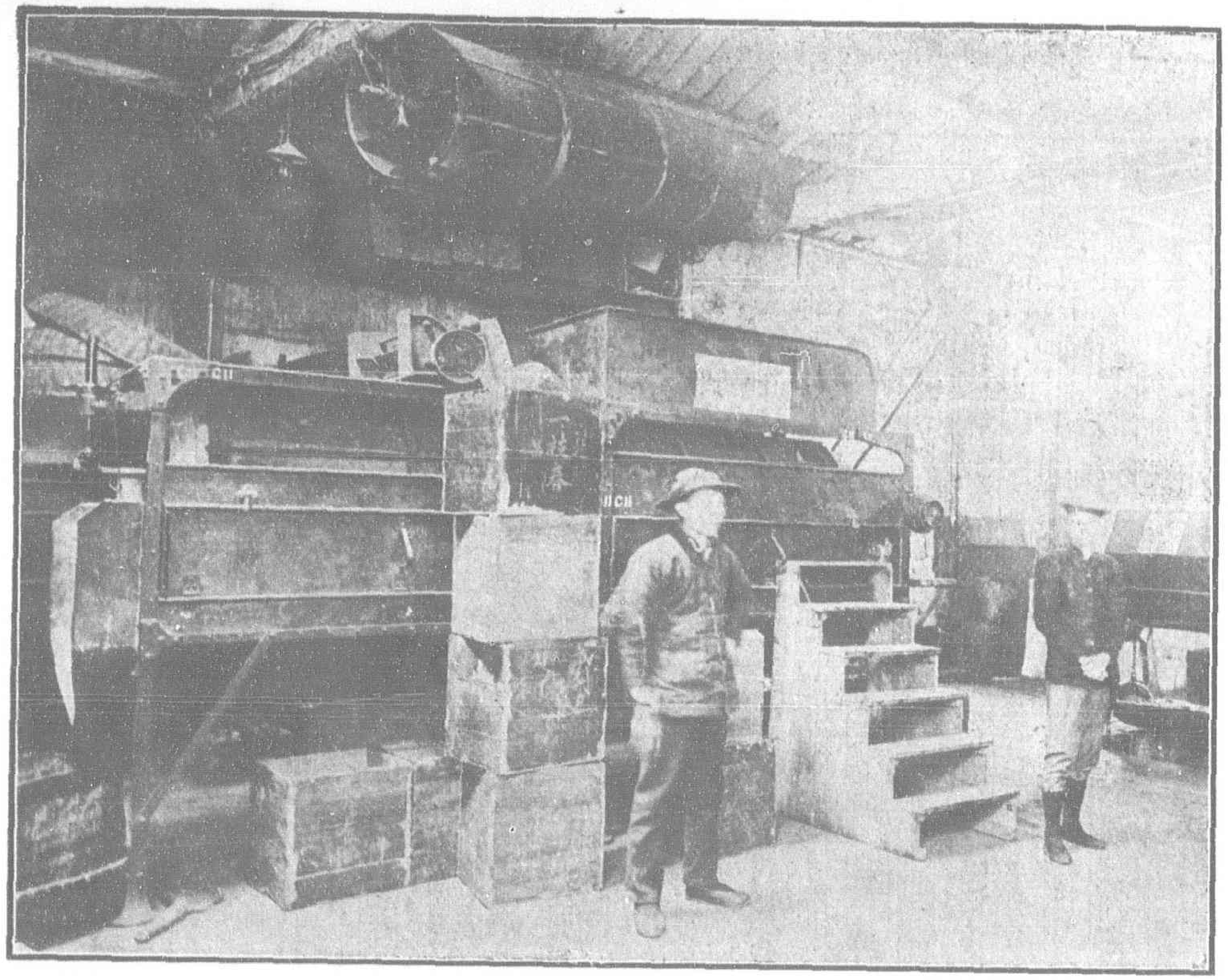
Faulty Manufacture by Handwork

From time immemorial, certainly from the sixth century of our era, China tea has been made by hand. Each little grower—and farms in China are seldom larger than one man and his children can handle—picked his tea and conducted at least the preliminary operations of preparing it for market. The result has been that no two lots coming from the farms was exactly alike and many handlings prior to ultimate sale in the export markets were necessary. Even in the picking, different standards prevailed in the several districts and gave rise to many grades, while the manufacturing operations such as withering and rolling, to say nothing of the extremes of temperature used in firing, presented multitudinous variations that were reflected in the appearance of the leaf, and what is more important, in the aroma and strength of the infusion.

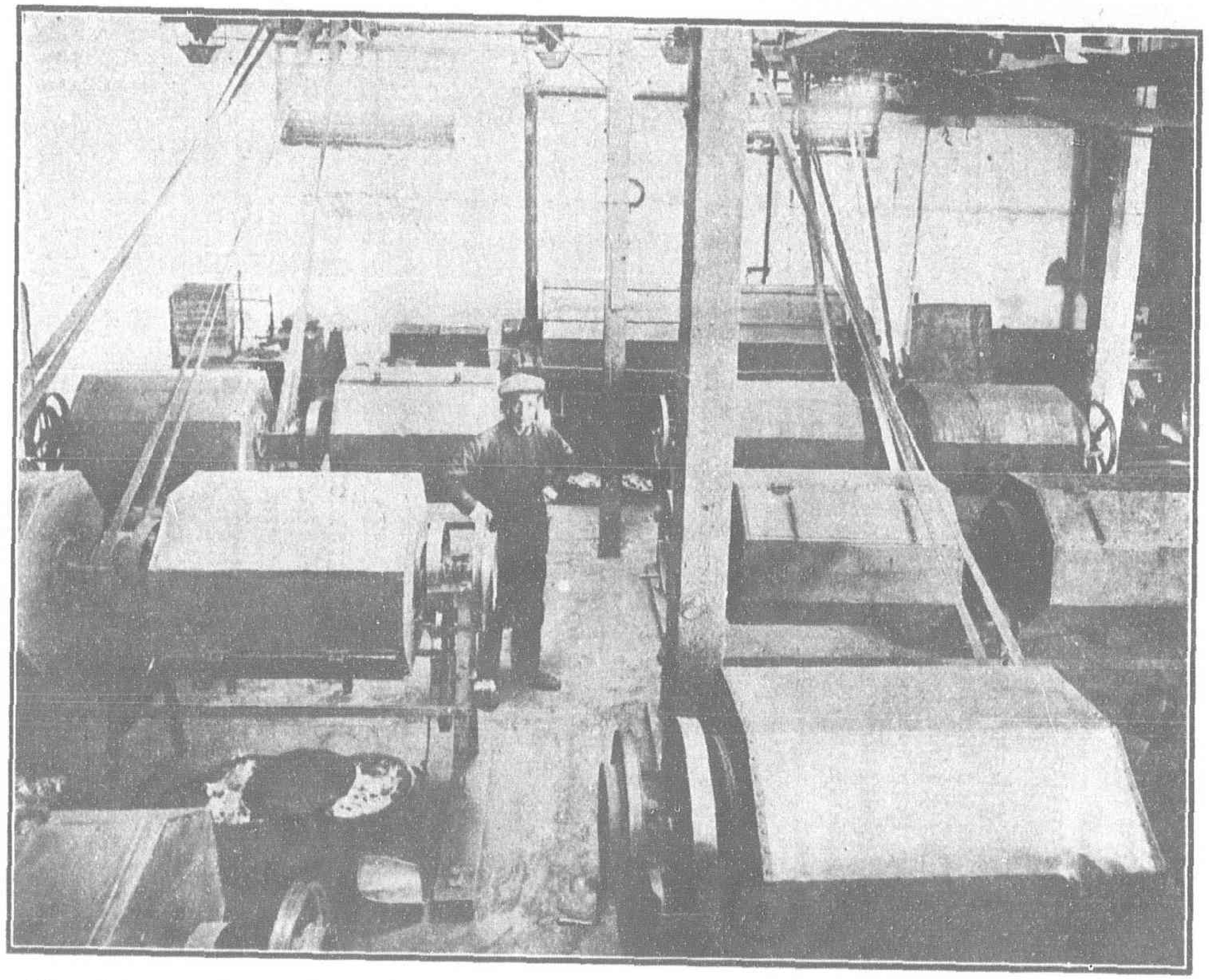
All these factors will be regulated in the product of the China Tea Company so that a definite quality can be turned out from season to season and the purchaser assured that the brand or chop on the package represents a certain and well marked kind of tea, the taste in the cup being the ultimate criterion of the consumer. To do this, the Ningchow Tea Plantations, Limited has acquired several thousand acres of tea lands in the Ningchow district, Kiangsi province, from which in the past some of the teas most celebrated among the Chinese have come. These plantations stretch from the lowlands up to the hilltops and in some areas, even the upper ranges of moderately high mountains are being brought under cultivation, for while the original tea plant doubtless was a denizen of the lower lying lands of Indo-China, yet the better teas have been found in many districts to be those from the higher altitudes. There the conditions of moisture and soil seem in most favorable combination for the growing of tea. Having fixed upon a district famed for the growing of tea, the quality of the leaf as it develops on the plant is considered by



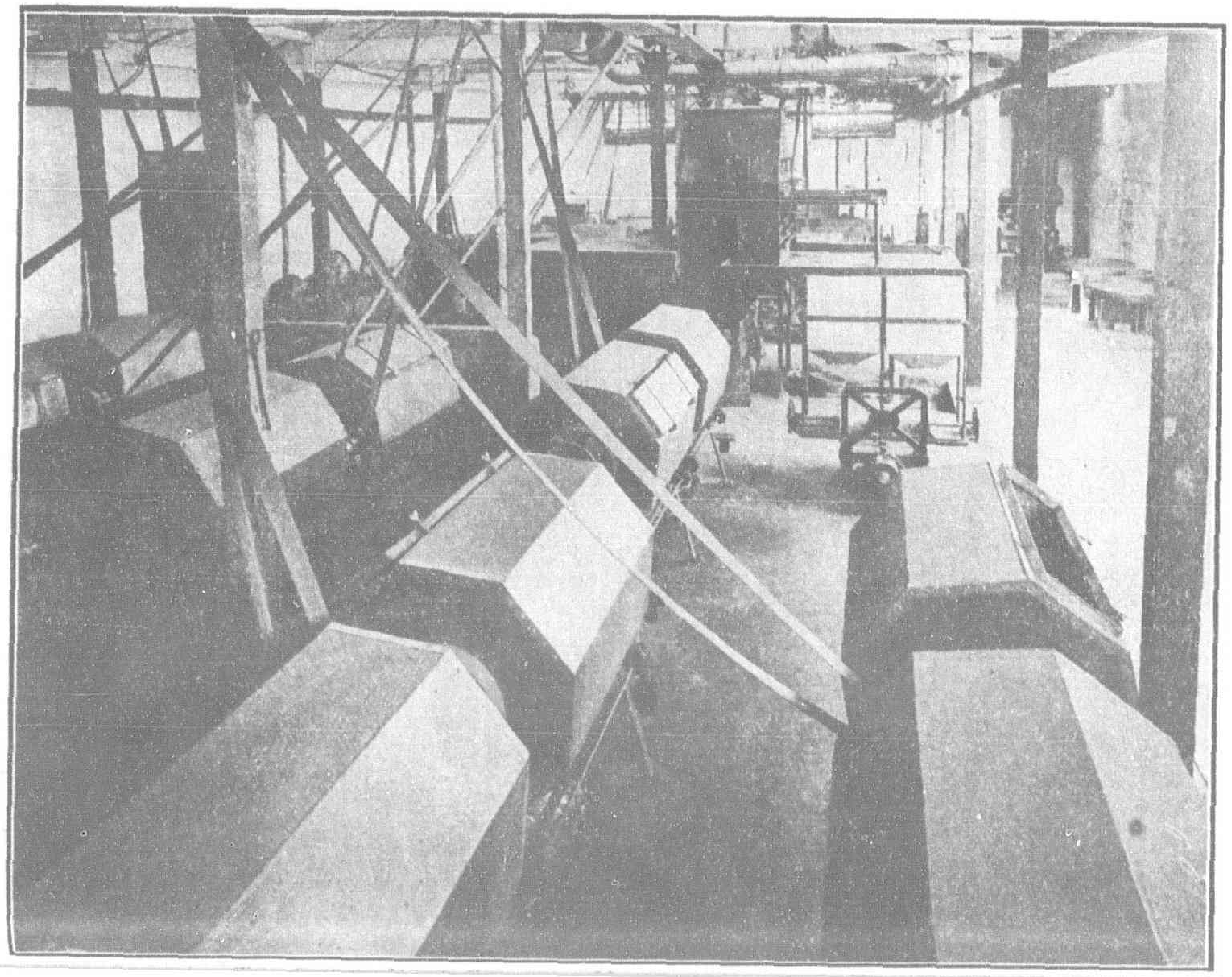
Improved Model of Tea Rolling Device Showing Method of Discharging Rolled Tea Through Door in Bottom

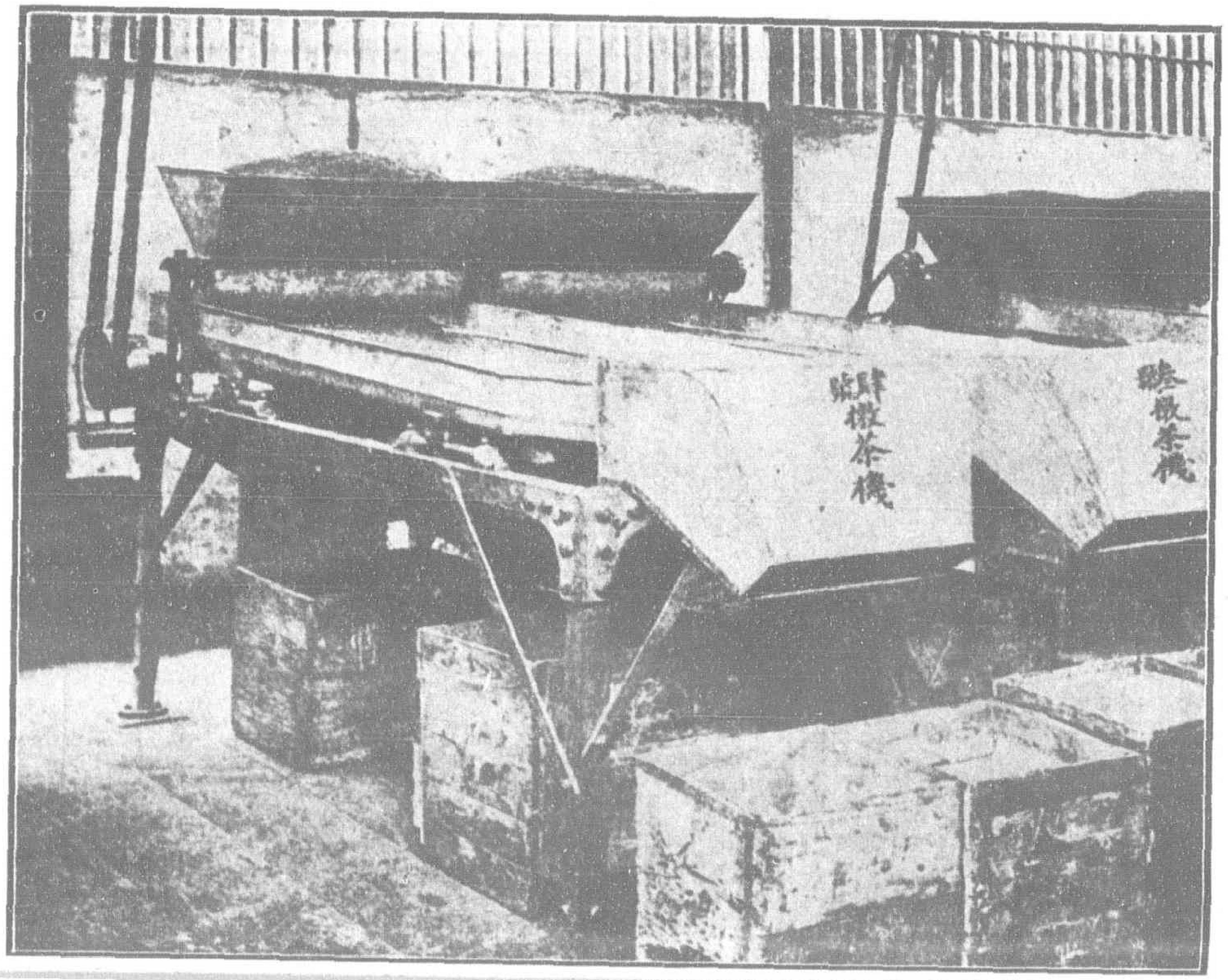


HEATING AND DRYING ROOM OF MACHINE TEA FACTORY



NEAR VIEW OF FIRING ROOM SHOWING CHARCOAL PANS IN PLACE UNDER MACHINE AT LEFT





the company to be assured, but manufacturing processes and their control are quite another thing.

Improving Tea Machinery

Mr. Chuck King-chang, Manager Him Shun On Hong and Inventor of Tea Machinery

This question of machinery for manufacturing the leaf and its control could be answered only by practical experience, so the promoters of the company set about getting that experience. Some years ago, when there was not one tea factory in Shanghai, and even the foreign tea buyers advised letting well enough alone, the company imported two machines and, with these as a basis, organized the first mechanical tea factory in Shanghai. It was soon found that the existing machinery could be improved upon, and this was the first task of Mr. Chuck King-chang, whose factory scrap heap holds a record of machinery improvement that is without parallel among the Chinese where most are content to take the original device as being the acme of perfection for the purpose it serves and to let it alone.

This was not the attitude of Mr. Chuck, who was dissatisfied with some of the results obtained, but who finally succeeded in eliminating the causes of his failures one by one, until he now operates two factories and has seen eighteen others spring up equipped with machinery similar to that which he is using, but operated by his competitors. After these years of patient experimenting, he is certain that China tea can be made by machinery and that the machinery can be built and operated by his countrymen. The experiments are not yet finished, but a plant has been evolved that will do the work and turn out two lots of tea so nearly alike that no expert can grade them apart.

Whether the tea turned out from the company's factory would meet the requirements of the trade was another question, and that too has been solved, in quite a novel manner. It had been demonstrated that good tea could be made from good leaf, but the company decided to go farther and see what could be done with inferior leaf. Hangchow, though it shares with Soochow, in the Chinese estimation, the designation of earthly paradise, has never been renowned for its tea, although some leaf is grown there. The company, therefore, decided to see what kind of finished product could be turned out from this particular leaf, especially since the hand rolling process certainly gave a poor product.

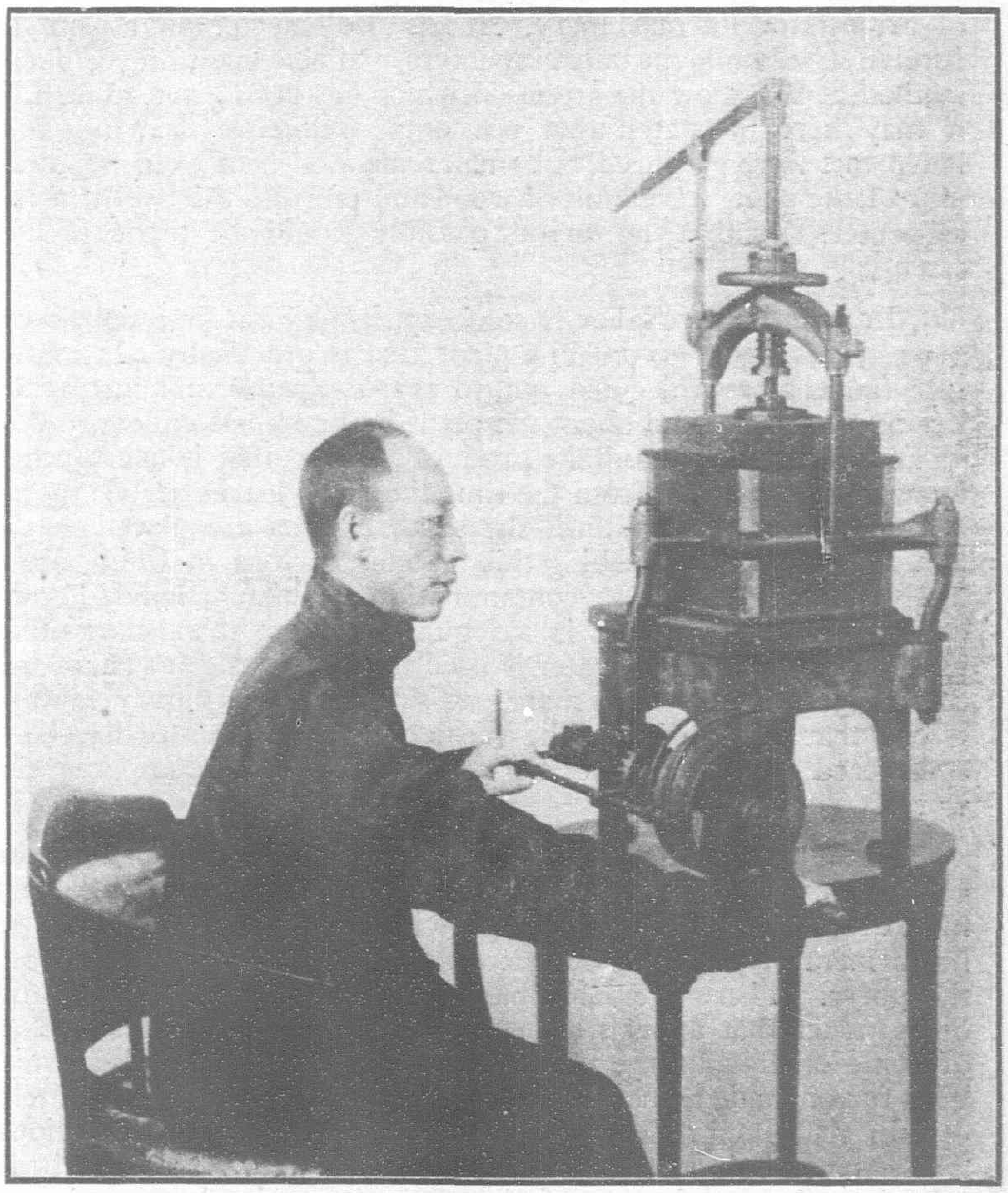
A few thousand pounds of Hangchow tea, therefore, was put through the mill and tried out in the London market. The company knew it was good tea, but they were scarcely prepared for the enthusiastic verdict given by the London merchants that tea equal to the sample could be sold in very large quantity in the British market. This was sufficient proof of the feasibility of the project and the China Tea Company is now getting ready for business on a scale that will make it a factor in the package tea trade of the world.

The first unit of the factory is now being built in Ningchow and will include not only the plant for finishing the tea, but from the withering of the leaf, the first operation, every phase of the manufacture will be provided for. The company recognizes that while sun withering may produce the best grade and is therefore the proper method, yet the weather is not always propitious, and they do not propose that lack of sunshine shall compel cessation of their operations. Without careful withering, the rolling fermentation, and subsequent operations cannot be properly done, and one of the first structures to be completed is the withering plant which has been equipped with hot air blowers and suitable means for lowering the temperature if that becomes advisable.

The operation of rolling is one that has called forth the full skill of the company's engineers and a number of machines have been devised only to be discarded as they were improved upon, until now a satisfactory one which handles up to fifty pounds of withered leaf at one time has been constructed. The importance of this machine and its influence upon the character of the final product can scarcely be overestimated. It is in the hand rolling process as used in China that the delicate aroma of the tea and its content of caffeine or thëine is impaired, since the hand method is to roll the leaves up in such a manner that the oil and other cells of the leaf are broken and the juices are permitted to escape, giving a tea without body and without that refreshing fragrance that distinguishes the good or well made tea from the bad. One of the causes of the success of the Indian and Formosan teas in driving China tea from markets in which it once was supreme, is that the competing teas are all machine rolled while the Chinese one is hand rolled.

Green and Black—Same Tea

The company will make both green and black teas and it may here be stated for the benefit of the tea drinker that his conception of black tea as being from a different plant than that which produces the green, is totally wrong, since it is merely a matter of fermentation that gives the change in color. The operation of fermenting is simple, but like all simple things is apt to be done hurriedly or with neglect of proper precautions, the resulting product lacking those properties in part which proper treatment would bring out to the full. Briefly, the rolled tea is exposed to the sun or warmed slightly by artificial means and then placed in a box which is covered with a cloth. The tea is examined from time to time and turned to prevent uneven heating. When the color is sufficiently advanced, and this is a point on which the judgment of every hand worker differs, the tea is immediately fired and made ready for shipment. In the factory, the



Latest Improved Tea Rolling Device Undergoing Test in Model Form fermentation is brought to exactly the same point, not on lots of a few pounds at a time, but on many hundreds, so that perfectly even quality is assured. The firing also is carried out under conditions that are exactly regulated. The tea is fired to contain less than a certain percentage of moisture, after which it is sorted by machinery into the various grades.

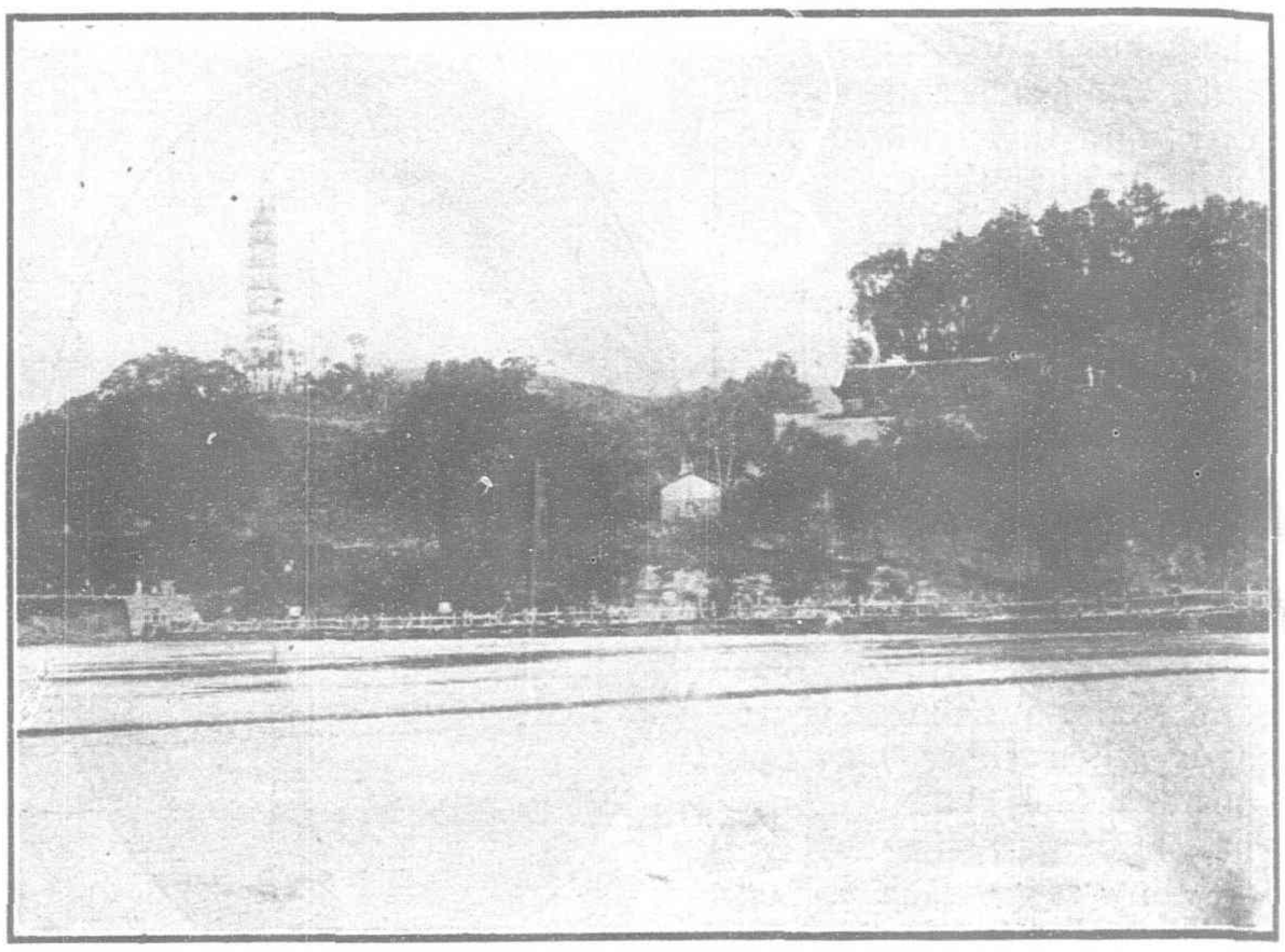
The firing machines are in effect eight-sided barrels that are revolved rapidly above a source of heat usually supplied by pans of charcoal, which can be raised toward or lowered from the revolving metal barrels. This is not all, for some teas require free access of air during the firing, so that the leaves are kept areated at a temperature best suited for that particular grade under manufacture. This feature has been developed in some of the China Tea Company's machines, until it now is possible to send a slow or rapid air current through the barrels as desired, the air current being regulated as the firing proceeds.

As the tea comes from the firing machine, no matter how much initial care is taken to use only certain sizes and shapes of leaves, the various grades or varieties as known in the trade are mixed in a seemingly inextricable confusion. It is therefore necessary to sort it into grades. One of the most interesting operations to watch is that of sorting out the slender or "spider-leg" variety of leaf from the fatter and shorter kinds. This is done by a rapidly vibrating wire screen upon which the little tea leaves dance their way down an incline, the thin ones standing upon their heads, as it were, until they find their way through the meshes of the screen while the fat ones roll off at the end, each into its separate receptacle. This machine is followed by one that carefully blows the dust away from the leaves and again sorts them into various sizes and shapes through a blast of air which blows some leaves farther than others and sends the dust to its own separate receptacle, for even the dust of the tea is used, being made into bricks for the caravan trade into Russia and Turkestan.

From the above account it may be assumed that the company has not had all plain sailing in its efforts to make machine tea. Its troubles are not yet over since its factory site is ten days away from Kiukiang, the nearest port of shipment for its product and of arrival for its machinery. It has also had to build a plant in foreign style, while the only carpenters available knew only Chinese methods. To show the attention which has been given to details, it may here be stated that not only architects' drawings and blueprints were prepared, but small scale models of every separate unit of the plant were built of wood and put into the hands of the carpenters so that no error possibly could be made in any essential.

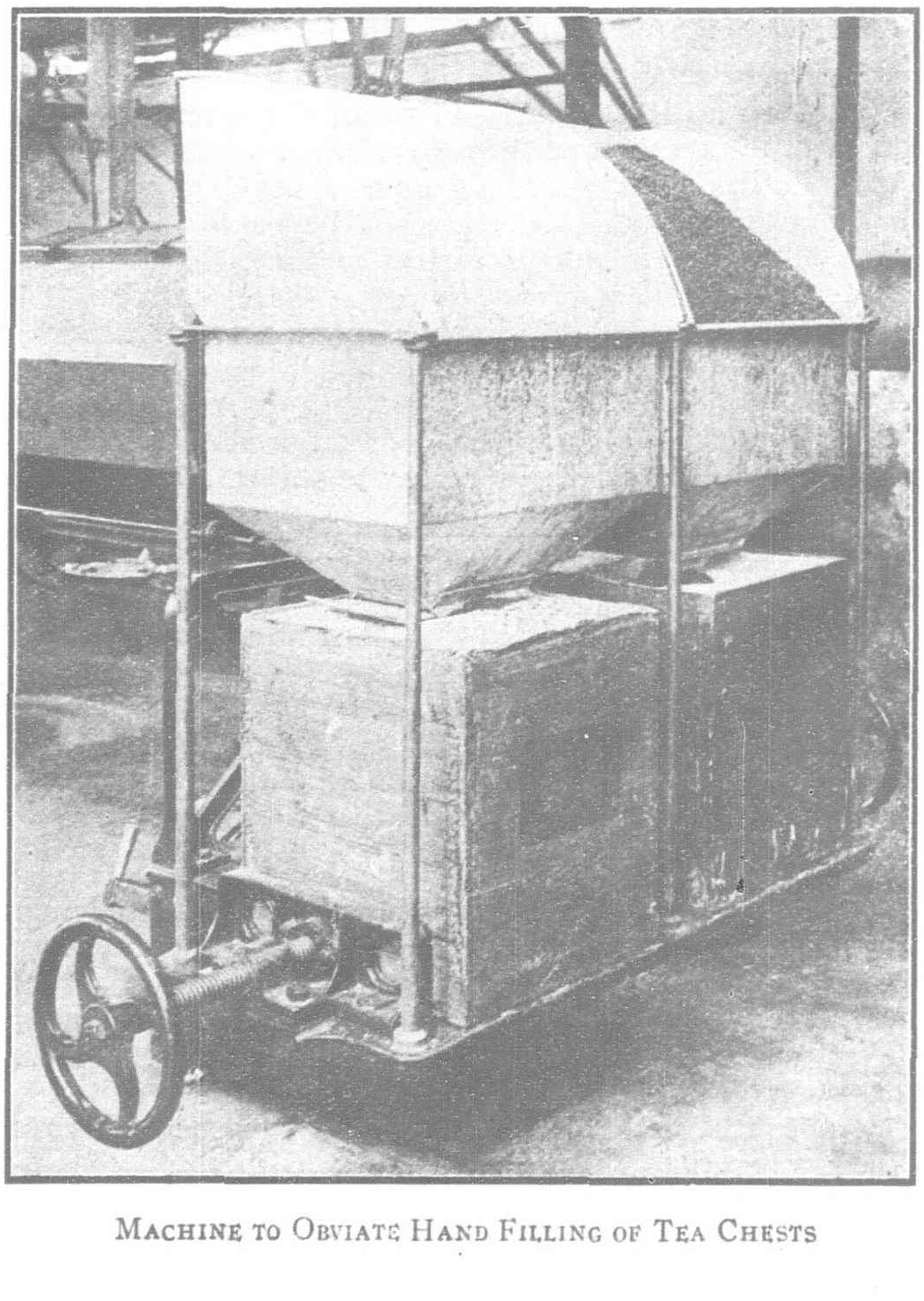
In a land where labor is so cheap, it might at first sight seem a waste of money to put in a plant that is practically automatic. But the company decided not to spare expense and instead of having the tea carried about the plant by hand, has endeavored to make an absolutely sanitary product and one that is not touched by workmen's hands from the time the fresh leaves arrive in the baskets of the pickers until the small cartons are placed in the boxes for shipment, making this first tea factory in China absolutely sanitary so far as contamination by human hands is concerned. Of course, tea is safeguarded more than some other products since boiling water is used in making the infusion, but the company believes, its managers say, that the sanitary feature is one that will appeal to the Westerner and therefore has been considered of great importance in planning and equipping the works.

These are only a few details of the preliminary work of the company. Very few enterprises spring forth Minerva-like, and most of them must experience growing pains that often result in impairment of the what Carlyle called pineal gland of civilization, the purse. There are fashions in tea as well as in clothing, and the product that appeals to one national palate will not suit that of some other country, nor will the same taste always prevail. This factor made it incumbent upon the company to be absolutely certain that its product would meet the desires of the various markets not only as to price but quality as well. This has been solved to the satisfaction of the promoters who have gathered together samples of every brand of tea in the world and have tested every one of them against their own product. Not only was this necessary, but even the style and size and material of the package also had to be considered and such factors as climatic conditions, shipping time and distance, and keeping qualities were taken into account so that packing in paper cartons will not be attempted in trying to enter a market that requires a tin or lead lined package.

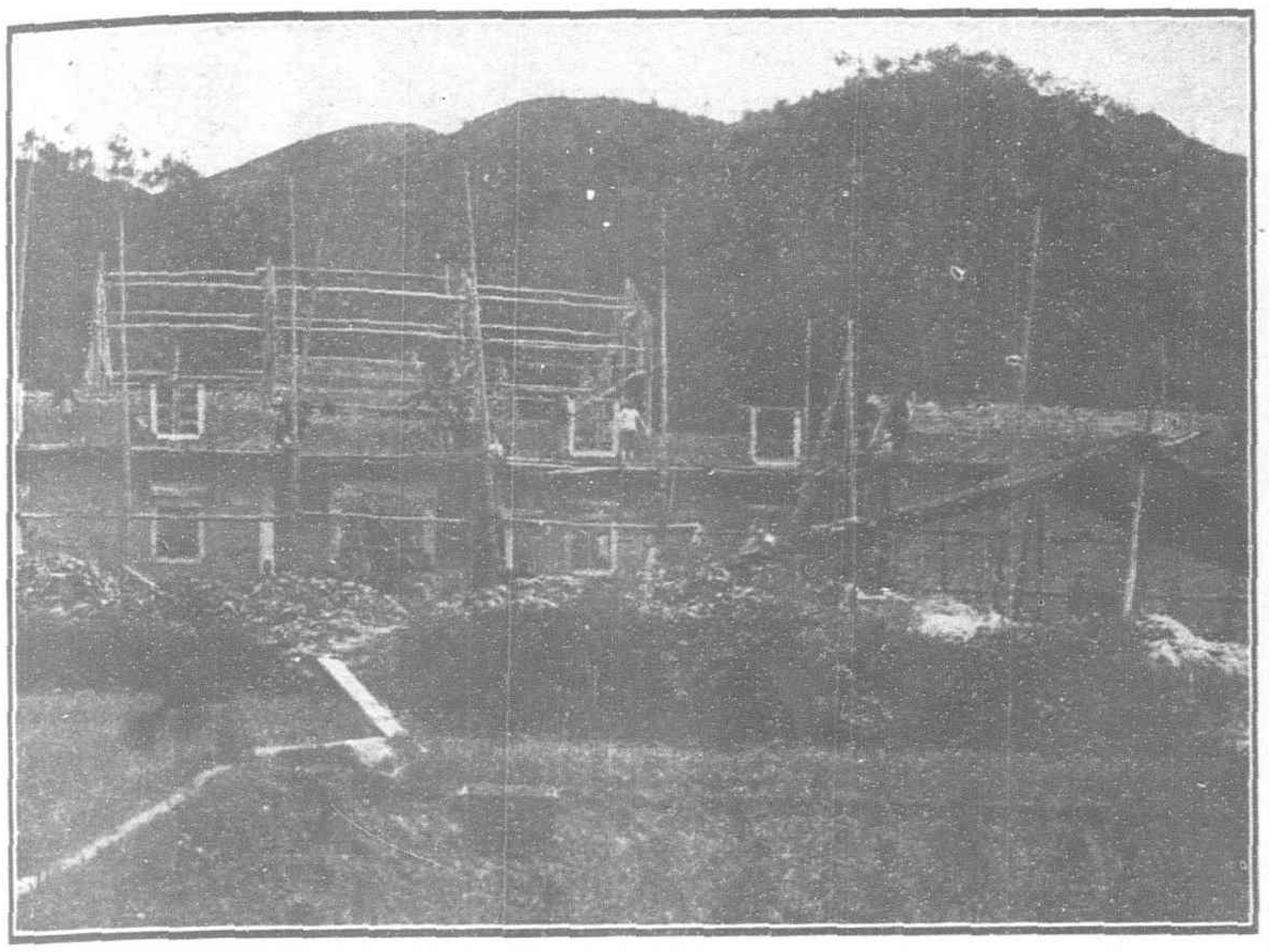


View on Road to Site of Ningchow Tea Factory

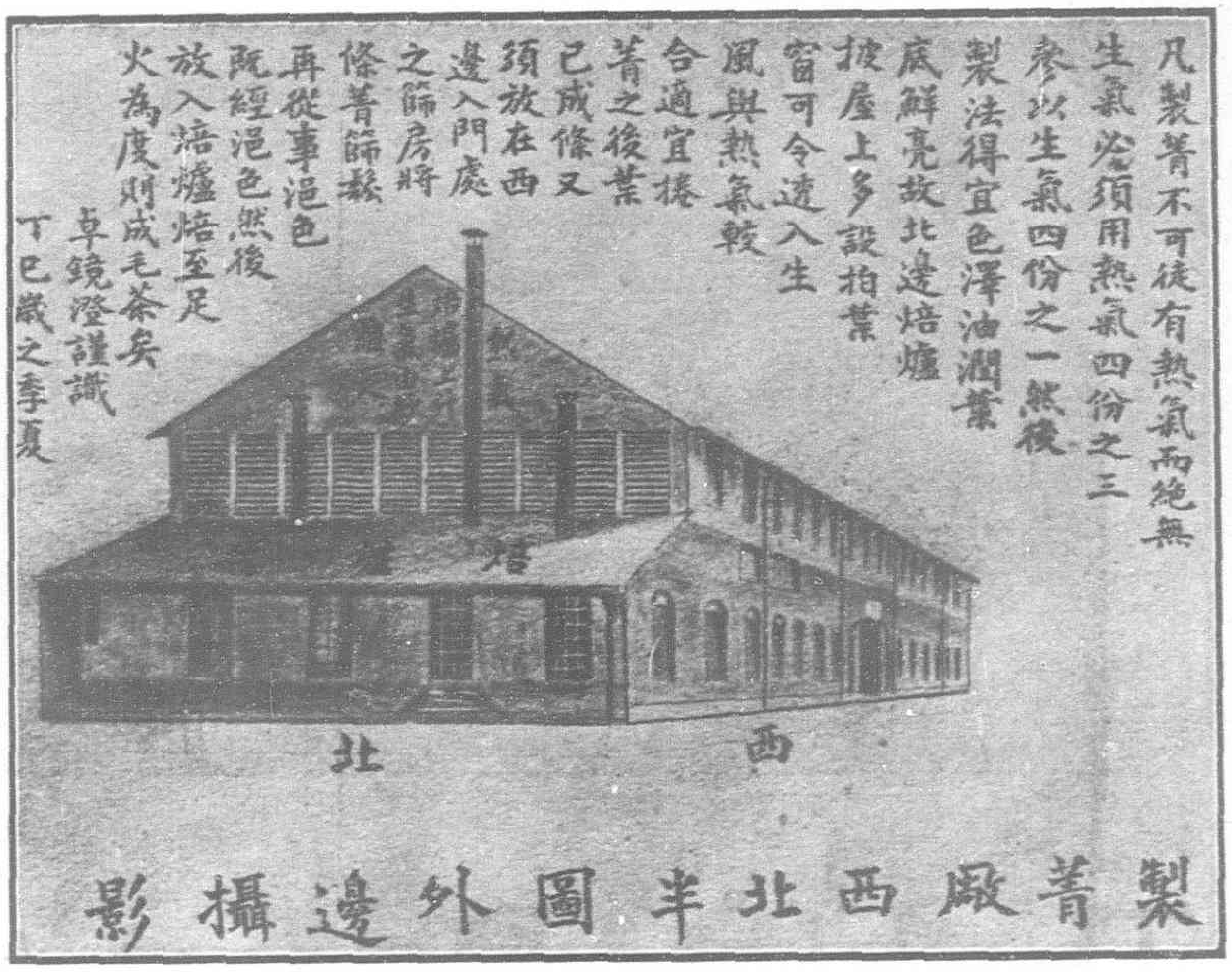
The work of preparation is now finished even to the printing of the cartons and labels which have been lithographed in China and have distinctly Chinese features while appealing to the foreign taste in design and coloring. Now all that remains is to finish the factory buildings before next April when the first picking of leaves is made and get the machinery working smoothly. This will complete the preliminary work and leave nothing but the one



Machine to Obviate Hand Filling of Tea Chests



One of a Group of Buildings for Tea Manufactory Being Erected at Ningchow


凡製菁不可徒有熱氣而絕無
生氣必須用熱氣四份之三
參以生氣四份之一然後
製法得宜色澤油潤葉
底鮮亮故北邊焙爐
披屋上多設拍葉
窗可令透入生
風與熱氣較
合適宜捲
菁之後葉
已成條又
須放在西
邊入門處
之篩房將
條菁篩鬆
再從事混色
既經混色然後
放入焙爐焙至足
火為度則成毛茶矣
卓鏡澄謹識
丁巳歲之季夏
焙
北
西
製菁廠西北半圖外邊攝影

Model of Withering House Built to Scale for Guidance of Ningchow Carpenters

great essential in every merchandising business, the selling end, to be developed. In this, as in the manufacturing, the company believes it will be successful, basing its expectations on the certainty that it will furnish a pure tea of the highest quality at a moderate price and will suit not only the palate, but the purse of the consumer.

The Grand Canal Improvement Contract

On April 19, 1916,* a contract was signed between the American International Corporation and the Government of Shantung for the improvement of the South Grand Canal. This contract provided for a loan of U. S. $2,500,000 at 90, interest to be at the rate of 7 per cent per annum, and the period of amortization to be 30 years. The agreement provided that Messrs. Siems and Carey should be the contractors to carry out the work stipulated.

After the signing of the contract Messrs. E. T. Gregory and W. F. Carey returned to New York to discuss the details connected with the carrying out of the contract with the American International Corporation. For one reason and another the Corporation seemed unwilling to proceed with the work under the terms secured by its representative, Mr. Gregory. Many changes and modifications were suggested by the Corporation, but no agreement could be reached at the time between the Chinese representative, His Excellency Pan Fu, and the Corporation.

It may be mentioned that in March of the same year an agreement for the improvement of the Grand Canal in the province of Kiangsu was signed by Dr. Gatrell, representing the Corporation in the absence of Mr. Gregory, and His Excellency King Pang-in, Director General of the National Conservancy Bureau. This agreement was never considered very seriously.

The negotiations to secure a modification of the main agreement dragged on until the end of the year without any results. In January, 1917, the public became aware of a change in the attitude of the Corporation in the shape of a rumor to the effect that the Corporation had decided to admit Japanese financial participation in the Canal contract.

As the contract had been signed as a purely American undertaking the Chinese showed some unwillingness to conclude a modified agreement to allow of Japanese participation, and though the Corporation insisted that Japanese participation would not be allowed without the consent of the Chinese, the negotiations still dragged on indefinitely.

The Corporation carried on negotiations with the Japanese representatives in New York and it was agreed between them that the following changes in the contract should be made to accommodate the entry of Japanese capital: (a) The loan should be made U. S. $6,000,000—five twelfths to be floated in Tokyo and seven twelfths in New York. (b) With the approval of the Chinese the Assistant Chief Engineer and the Assistant Chief Auditor to be Japanese. (c) Japanese construction assistance in the matter of labor, etc., to be allowed if found necessary to the work. (d) The amortization period to be reduced from 30 to 20 years. (e) The Chihli Grand Canal to be included. (f) Option on the Kiangsu section of the Canal to be granted if foreign capital is used.

The contract embodying these modifications was not signed until November 20, and then it was signed by Mr. Hsiung Hsi-ling, the Director of the Chihli Flood Relief and Mr. W. F. Carey, representing the Corporation. For some reason the proper organ, the National Conservancy Bureau, did not sign the documents.

It is to be hoped that this instance of Japanese-American coöperation, as agreed to between Messrs. Carey and Hsiung Hsi-ling, will definitely disprove the contentions of critics that such coöperation is detrimental to the political and economical independence of China.

Mr. Carey left for America the day following the signature of the agreement to make the necessary financial arrangements, and no doubt work will be begun when the agreement is accepted by the Corporation, and when it is ratified, if that is deemed necessary, by the Cabinet and Parliament, or whatever body stands for Parliament.

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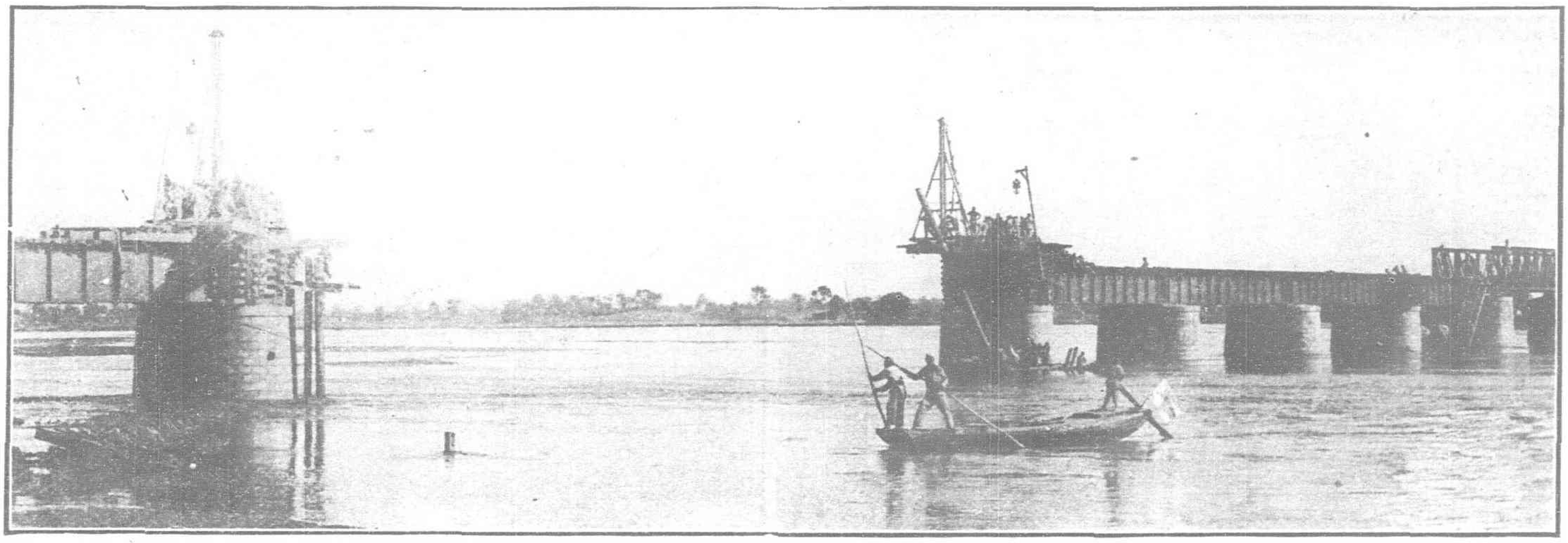
* See Far Eastern Review, August, 1916, for details.



A Breach in the Hsinloho Bridge

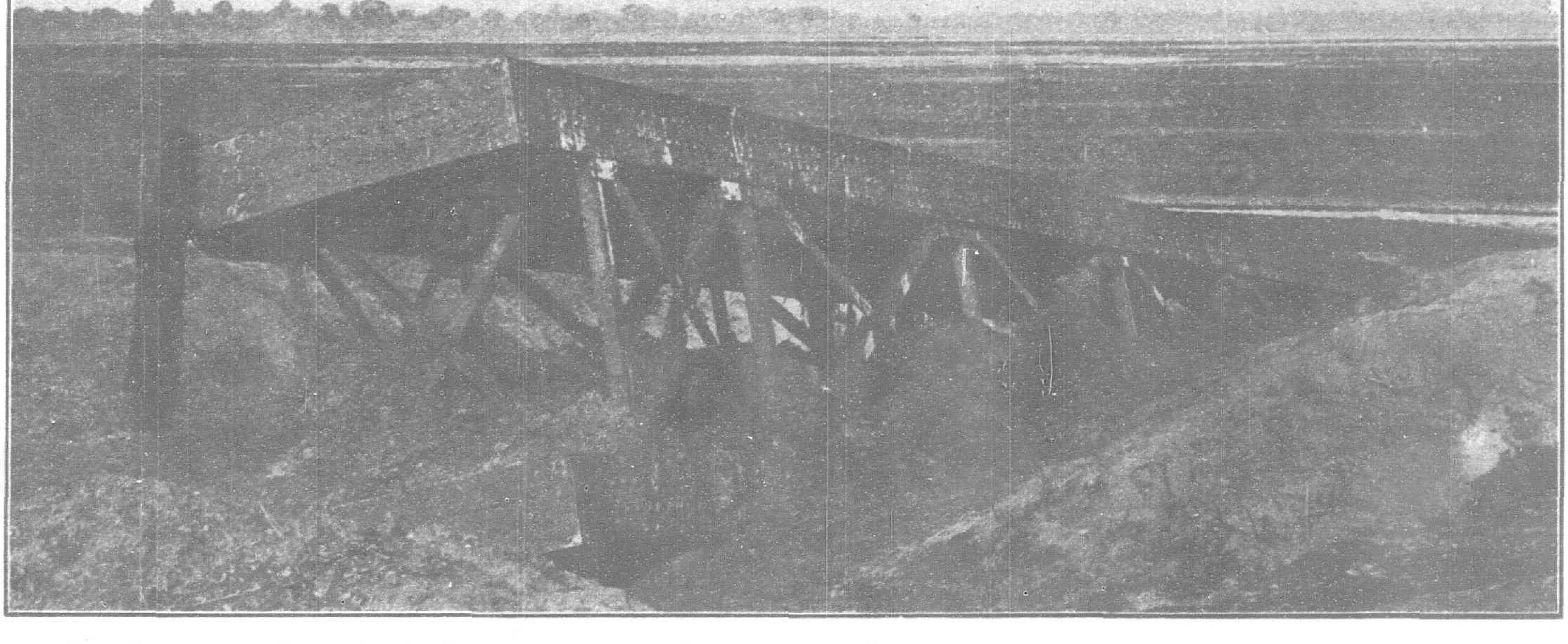
The Flood Damage to the Peking-Hankow Railway

The phenomenal floods which occurred in the northern part of China during the summer, and which have been referred to in previous issues, continue to be the source of suffering and the subject of serious investigation on the part of those engineers eager to find some method of preventing them in the future.

Over vast stretches of country waters still form a lake, and with the advent of winter this was transformed into solid ice. The outlook is decidedly serious for all those who have hitherto been supported by the inundated land, nor is there any telling when the waters will subside and allow the land once more to be cultivated. In the meantime, the thousands of people who have been forced from their property are living as refugees in Tientsin and other cities, or are clinging to any spot which escaped inundation in the vicinity of their submerged homes in order that they may begin to rebuild their tumbled mud houses immediately opportunity presents itself. For these unhappy sufferers the situation is terrible. They have lost everything in the shape of property except the little they could tie up in bundles and carry to the high and dry spots, and the fearful cold of the North China winter will intensify their misery.

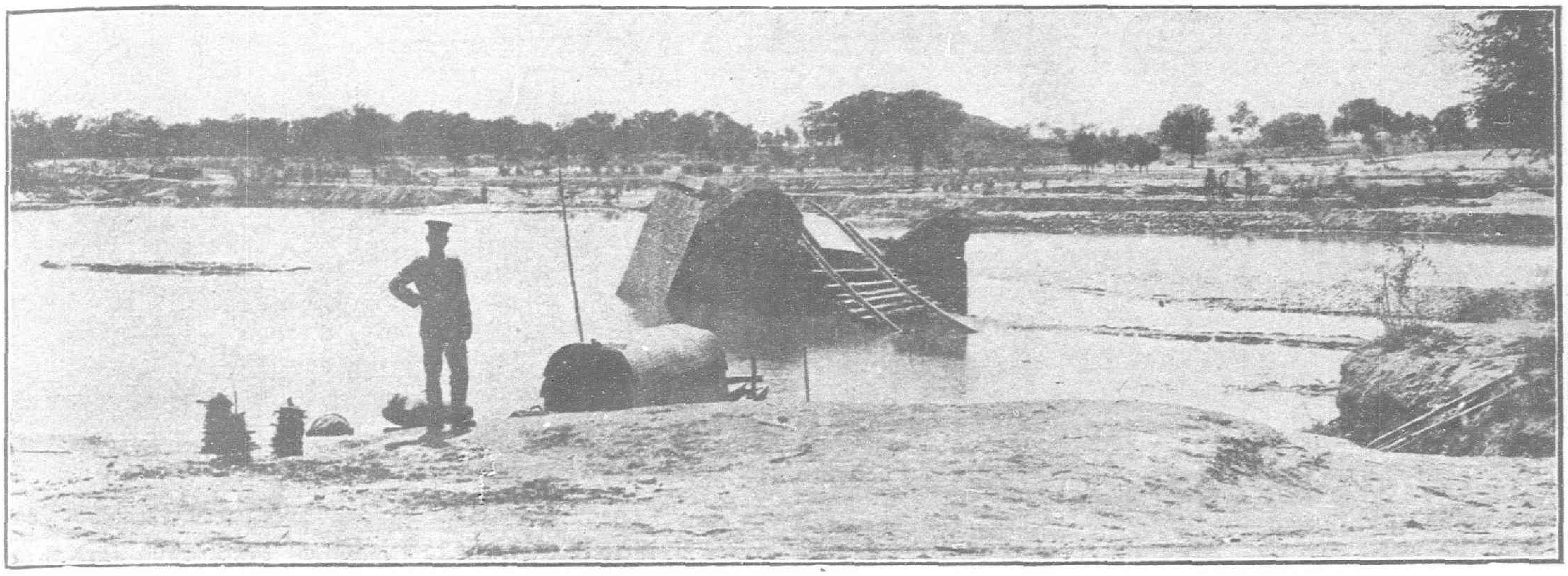
No accurate estimate of the total damage done by the floods has yet been made, nor is it possible to make one, but some idea of the force of the waters and the resultant destruction of property may be gathered from a glance at the photographs illustrating the damage done to the Peking-Hankow Railway. It will be realized that when such work as this has been unable to resist the strength of the tumultuous flood no Chinese village could at all withstand the pressure, and therefore all homes and villages unfortunate enough to be in the affected radius must have disappeared.

At one place where the waters accumulated to a great depth, as a result of the waterways in the railway embankment being too small to carry off such abnormal floods, foreign passengers who were marooned were afforded the pitiful sight of a large village in process of inundation, and saw hundreds of houses collapse in a

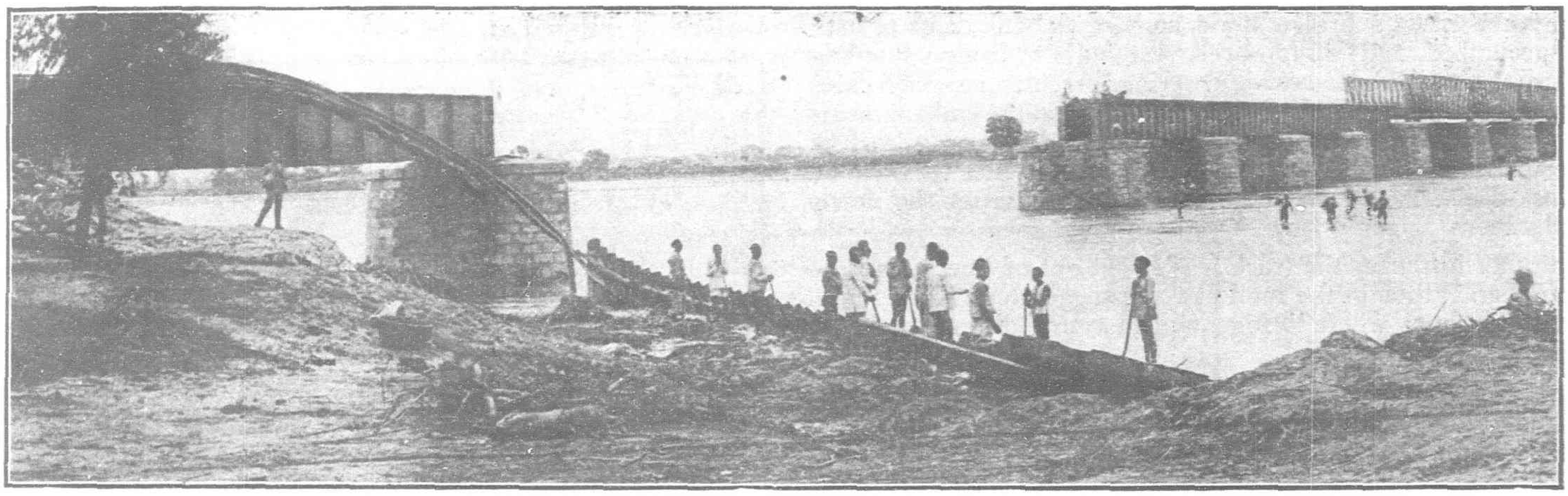


The Force of the Flood May Be Estimated from the Fact that This Steel Girder Said to Weigh "Several Hundred Tons" Was Washed Fourteen Kilometers Downstream from the Bridge over the Hsinloho

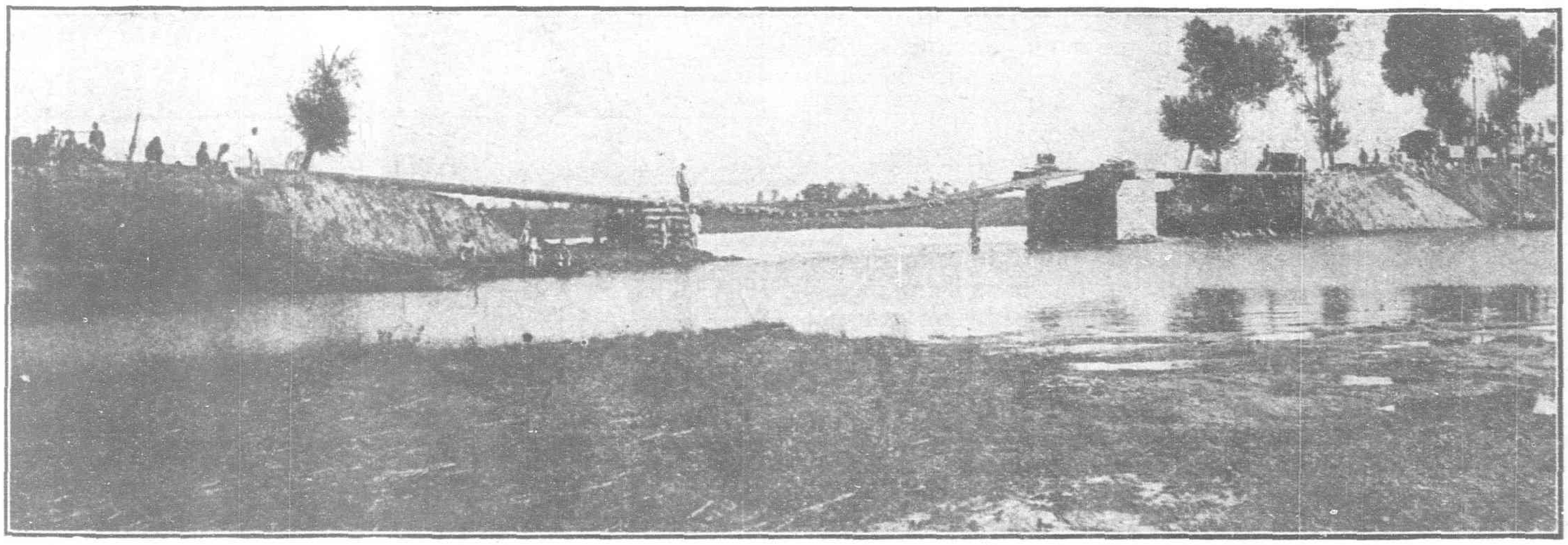
Views of Damage Done by Floods to Railway Bridges



All that Was Left of a Bridge



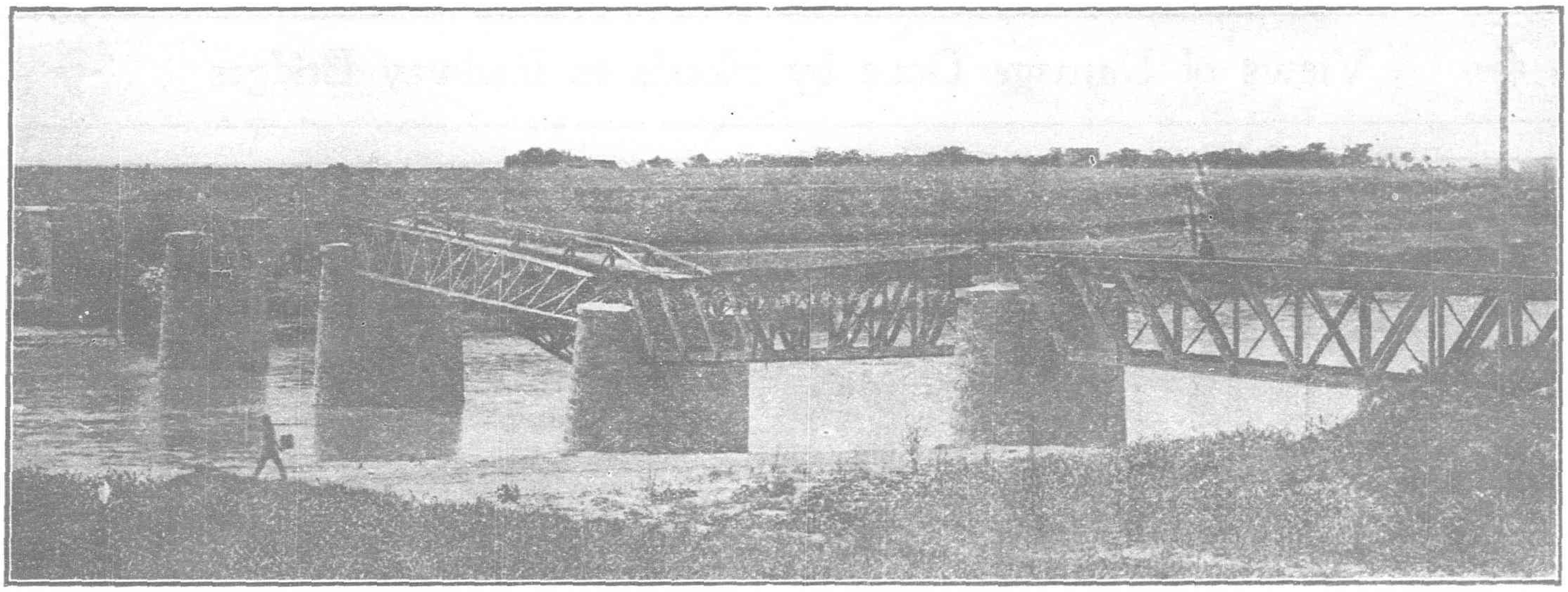
Three Spans and Two Piers Completely Washed Away



Destroyed Embankment South of Chengtingfu

very short time as the mud walls became saturated with the rising waters. So fast was the disappearance of the houses in the flood that they seemed simply to melt away, as in fact they did. And this was the fate of thousands of villages, and millions of homes.

Altogether some five hundred miles of line were involved. There were twenty-three breaches of considerable size, some extending to a width of four miles. They were not due to any inferior work, or as a result of the embankments being too low. All the embankments were higher than the flood, and all masonry was of the best. The damage was due solely to the phenomenal nature of the rainfall, the changing of river courses, and the fact that sufficient openings in the embankment had not been provided for such a contingency.



BRIDGE OVER THE CH'I HO IN CHUN HSIEN, HONAN PROVINCE

Where the waterway was large the bridge withstood the force of the current, high as the flood was, and in this connection may be cited the long bridge over the Putow River, near Chengtingfu, which came through the ordeal uninjured.

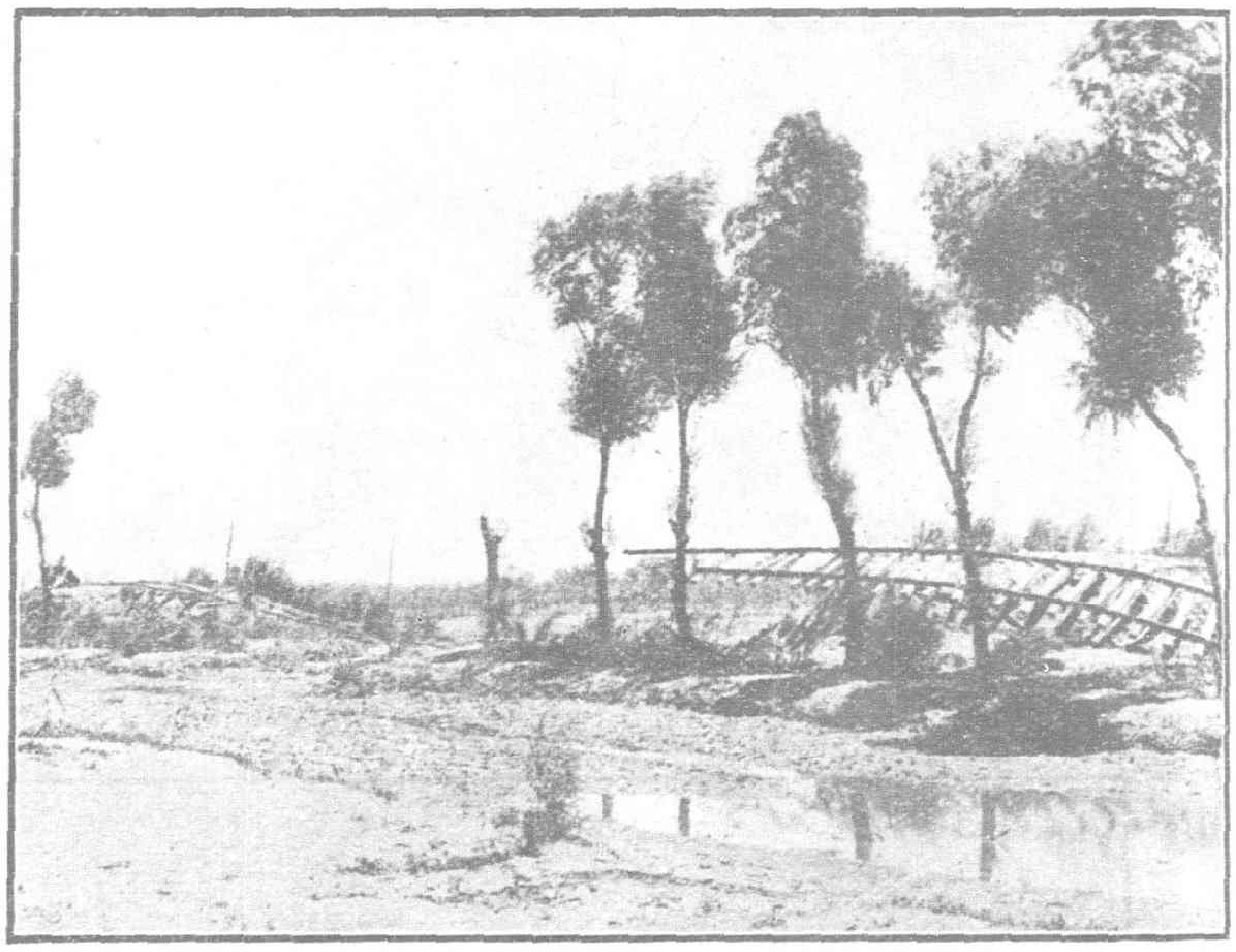
In some cases a bridge stood, and the embankments at both ends succumbed and disappeared, leaving the bridge standing intact in the middle of a wide, roaring torrent. In other cases the track was entirely washed away; while again the embankments went, and left the track suspended in mid-air as a sort of suspension bridge, it being possible for pedestrians to walk on the ties that adhered to the rails, and thus cross the newly created stream.

In other instances the track was swept out of line, turned on edge, and stood thus in the mud like an exaggerated picket fence. In the few cases where bridge and masonry disappeared they were short spans.

One of the most striking freaks of the flood was performed at the Hsinlo River where there is one of the largest bridges on the line. The damage was, in fact, severe in the whole vicinity of this river. The masonry on which the bridge rested, with the exception of two or three of the piers, was not damaged, but the force of the water was so great that it undermined and swept one pier completely away, and carried one huge steel girder weighing several hundred tons downstream some fourteen kilometers, where it was found partially buried in the mud. Another girder did not fare so far. It is deep down in the mud of the river bed, and whether it will ever be retrieved, is problematical. The span which voyaged downstream may be recovered, but the task will be heavier for the engineers than the flood found it to be. In spite of the fact that some of the spans were thus removed the remainder of the bridge was uninjured.

The deck lattice-girder bridge across the Chi-ho, in Honan, was seriously affected, owing to one of the piers being undermined and partially sinking. Though the steelwork was not dislodged it was seriously wracked.

The task of repairing this line, while the floods still continued, was a great one, but was tackled with determination by the Managing Director, Dr. C. C. Wang. Immediately the waters subsided sufficiently to allow ideas of how to proceed to be formed, he visited the whole of the affected area, and, with the engineers, began the work of renovation. By offering rewards to the workmen speedy results were obtained, and thousands of laborers were employed in rebuilding the embankments and putting up temporary bridges to carry the trains over the rivers where the bridges had been put out of commission. The personal interest taken in the work by the Managing Director,—rather an unusual thing in China, and therefore striking and to be highly commended,—inspired the workers to such an extent that traffic was resumed long before the estimated time, and travelers and freight were able to cover the distance between Peking and Hankow without inconvenience and without much loss of time in comparison with the previous schedule, despite the fact that two other floods succeeded in removing much of the new work. In the meantime, the repair of the damaged bridges is being pushed forward as rapidly as steel and other necessaries can be procured.



SOUTH OF HSINLO-HSIEN

For the speedy manner in which initial difficulties were surmounted the greatest credit is due to Dr. Wang, who thoroughly demonstrated the value of his foreign training and experience.

NIPPON YUSEN KAISHA TO BRAVE U-BOATS

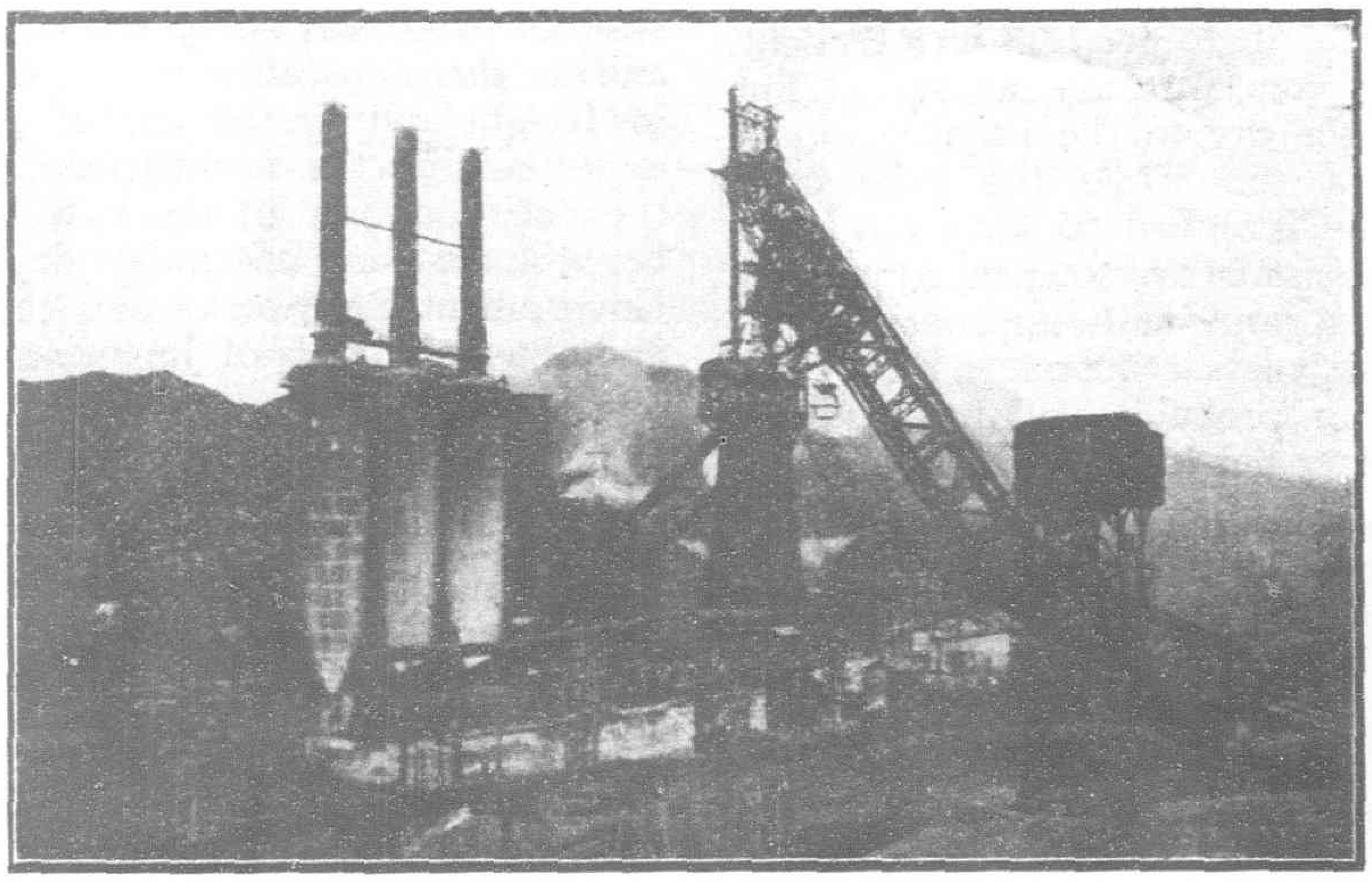
Merchants in Japan who are engaged in trade with France and Italy will be glad to learn, says the Japan Advertiser, that the Nippon Yusen has decided to brave the submarines and revive its direct line between Yokohama and Marseilles, which has been suspended for some time because of U-boats' activity in the Mediterranean. The Nippon Yusen Kaisha recently decided to start a line between Yokohama and Port Said, with the object of helping trade between Japan and France. Owing to the submarine dangers, the company proposed to dispatch steamers only as far as Port Said. But now the company has put on a connecting steamer and will land cargo at Marseilles.

Blast Furnaces Making Manchuria More Prosperous

Penchihu Colliery and Mining Company Blows In Second Unit of Plant

By the blowing in of the second unit of the Penchihu Colliery and Mining Company's blast furnace plant, on December 8, another beacon has been lighted on Manchuria's road to prosperity and another forward step taken in the utilization of some of the wealth in iron ore that China's territory contains. Apart from this, enhanced prosperity has come to many individuals among the Chinese, as workmen at the plant and the number of those engaged in this lucrative trade of iron making has been doubled.

It is now scarcely a dozen years since the first pick stroke of the colliery company's workmen started opening the vast coal deposit that underlies so many hundred acres of land about Penchihu. Then the town was known as Penhsihu and was a collection of a few score hovels. Now it is a town of many thousand souls all of whom either labor in the mines and works connected with them or are supported by those who do. It is due to the foresight and determination of Baron K. H. Okura, one of the best known among Japan's captains of industry, that not only the mine has reached its present high stage of development, but that the iron furnaces have been built and the way paved for the creation of a great steel industry with its rolling mills and other finishing machinery that may in time employ tens of thousands where hundreds are now at work. It is especially due to his perception of one of the basic principles of production that the blast furnaces are now turning into money the iron ores of the Miaoehrkou mine which had lain unused so many years.



Blast Furnace No. 1 in Center Showing Hoisting Gear for Charging Furnace—Triple Heating Stoves on Left

Concession Granted in 1906

Baron Okura first secured the concession to mine at the then Penhsihu in 1906 on the property that was turned over to the Sino-Japanese company, of which he is the head, in 1910. The following year, Baron Okura pointed out to the Chinese the advisability of selling the coal in some manufactured form rather than shipping it out as raw material. This was a novel idea to them and it was not until it was shown that the coal could be used to turn the iron of an adjoining mine into pig iron, a much more valuable commodity than the sum of the values of iron ore and coal of which it was made, that an agreement to organize the steel company was signed on October 6, 1911, the capital being increased from Mex. $2,000,000 to double that figure.

Three years elapsed before the iron deposit was opened and the first blast furnace ready to receive its initial charge of ore, the fire on the furnace hearth being lighted by Baron Okura in person on January 13, 1915. The tapping of this furnace produced the first iron that had come from Manchurian materials since the days of Tung Chih of the Manchu dynasty, and the first iron that ever had been made there by modern metallurgical methods. Now the capacity of the company has been doubled and it is expected that the full 260 daily tons will soon be reached and perhaps surpassed as the men become accustomed to the vagaries of the new blast furnace.

To make iron and steel, three factors are absolutely essential. The coal must be of coking variety, forming a dense hard mass that will not crush to powder under the weight of the charge; the iron must be reasonably rich in metal and low in sulphur and phosphorus; and the supply of limestone, which is used as a flux, must be plentiful, pure, and cheap. All of these requisites are present in or near Penchihu. The coal is a semi-anthracite that makes an excellent blast furnace coke and the iron ore is a magnetite that runs to 70 per cent iron content. The third ingredient, limestone, is found underlying the coal measures and conveniently outcrops so that it can be run to the furnace top in mechanical conveyors as it is needed.

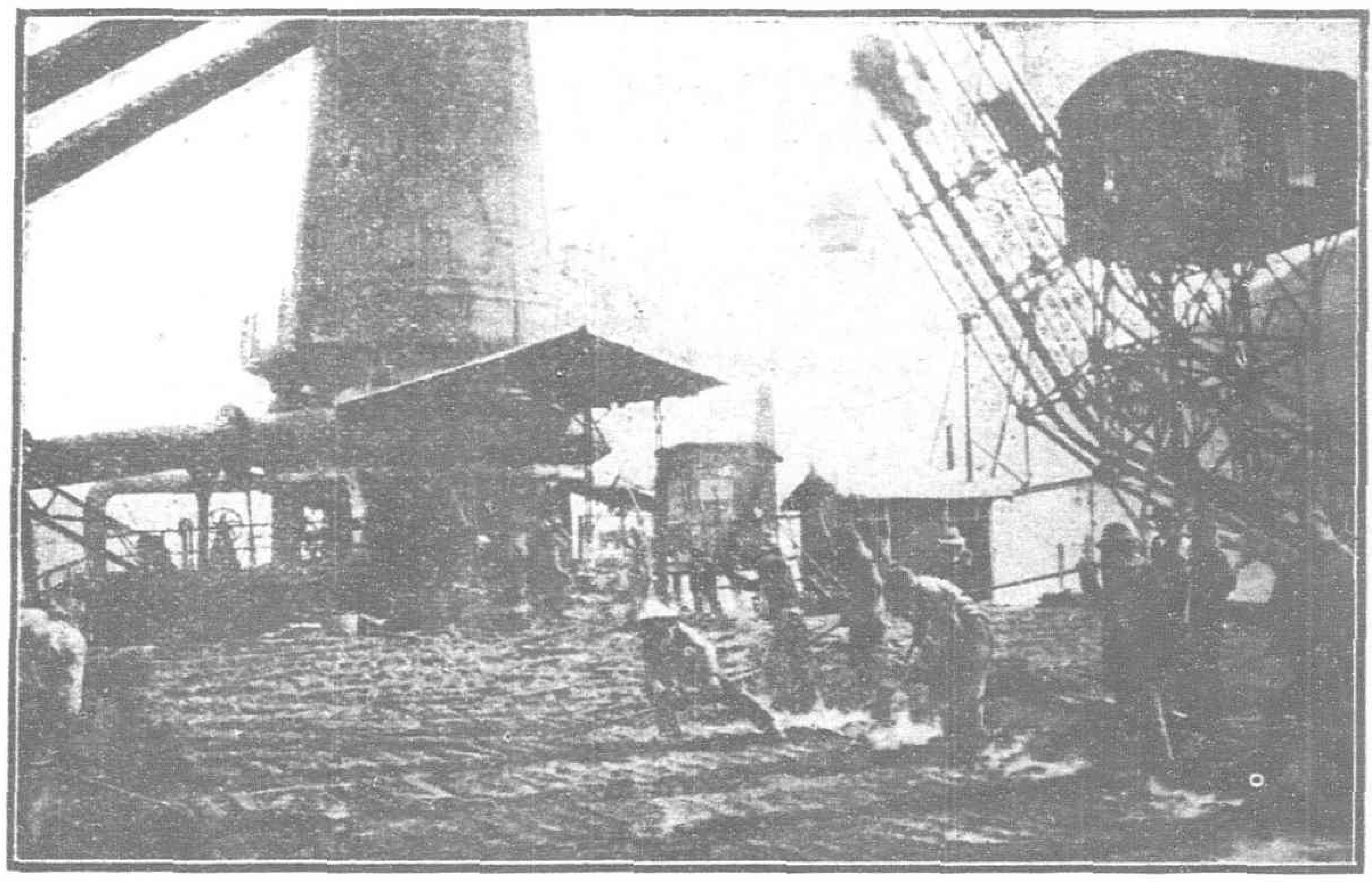
Iron Supply of Miaoehrkou

The iron ore for the Penchihu furnaces is of two sorts, one a rich variety of magnetite said to contain 70 per cent of iron but which is not inexhaustible in quantity. This is from the Miaoehrkou mine and is being developed as rapidly as need has arisen. Aside from this, there is a vast tonnage of low grade ore said to run between 30 and 40 per cent iron available in the hills around Penchihu, and is most favorably located so far as transportation to the blast furnaces is concerned.

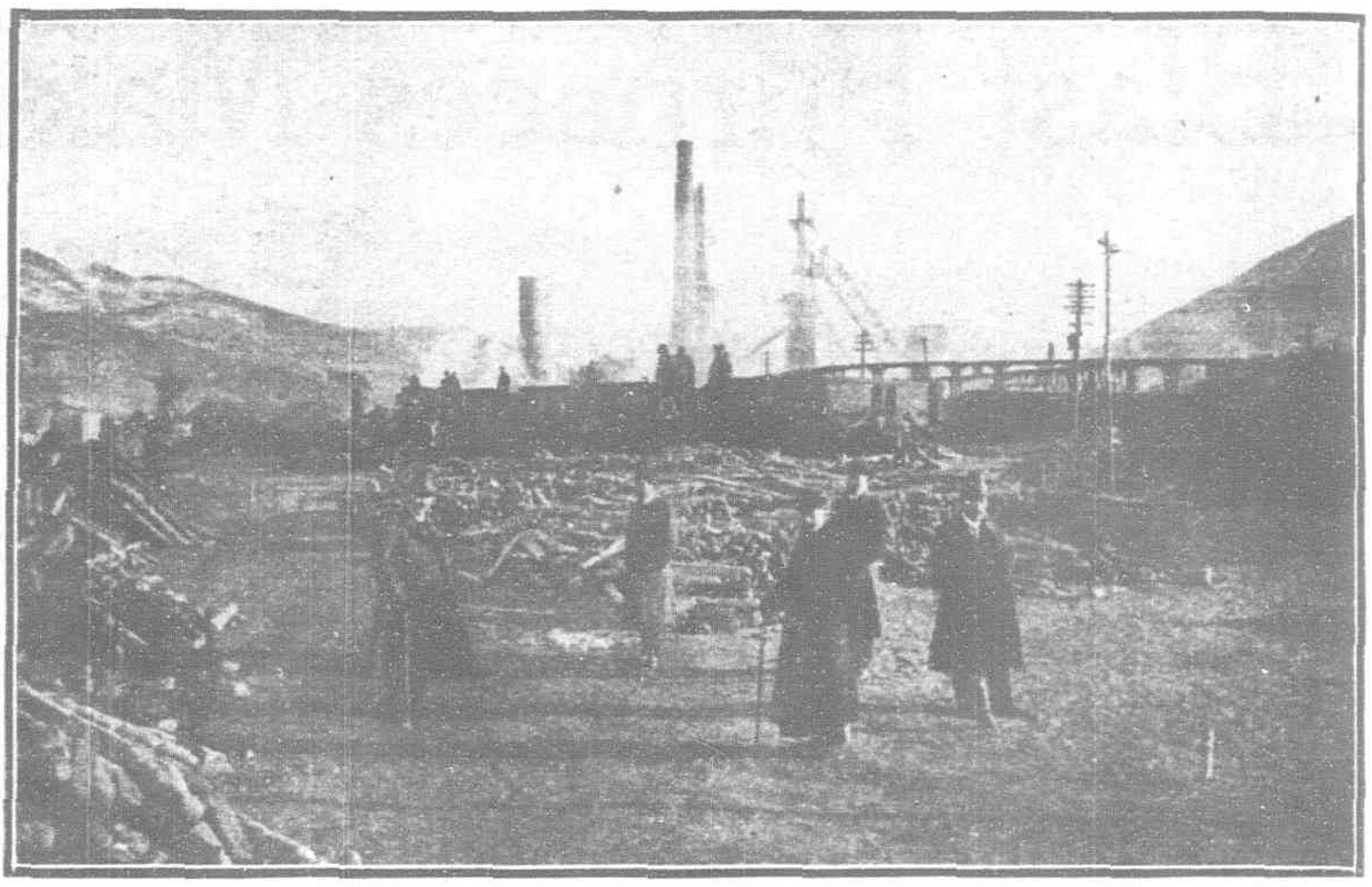
Upwards of 120,000,000 tons of this grade of iron is said to be available, but it cannot be profitably mixed with the richer ore and run into the furnace, needing further concentration before smelting. In 1915, the company received specifications from England as to methods of treating these lean ores and after exhaustive experiments has decided upon a magnetic separation followed by briquetting under the Grongahl system. The wet crushed ore after passing under the magnets is further concentrated on tables such as are used in other metalliferous mining operations.

This product, which is about 60 per cent iron, approximating good hematites in composition, is then briquetted and baked in a kiln, after which it goes to the furnaces. Efforts are being made to obviate the baking process by mixing the ore with lime and briquetting the resulting mass to a stone-like consistency.

At the start, even the Miaoehrkou ore was not used solely, but was mixed with ore from the Angaku mine just south of Chinnampo, Korea, until the furnace proved its ability to run on straight Miaoehrkou ore. At the start, the control of the output was difficult as the varying percentage of sulphur and phosphorus in the pig iron showed, but the company patiently experimented in the face of pitiless criticism and finally has brought the analysis of its product to run as follows: Carbon 3 per cent; silicon 3.4 per cent, phosphorus 0.06; sulphur 0.05; and manganese 0.20 per cent. Some of the analyses have run as low



Near View of Base of Furnace Showing Pig Iron Casting Beds in Foreground



Storeyard for Pig Iron Showing Loading Tracks with Blast Furnace Plant in Background

as 0.02 in sulphur, but the higher figure is deemed not to vitiate the use of the pig iron by steel makers generally. It is expected that the phosphorus also will be considerably reduced as furnace conditions are gradually brought under more complete control and the composition of the charge regulated with this end in view.

Iron Ore Easily Worked

The ore strata at Miaoehrkou lie parallel with the slope of the mountain and are easily worked. According to former estimates, some 80,000,000 tons are certainly contained in the deposit with a probability that this figure will be revised upward as development work proceeds. This estimate, however, does not confine itself to the high grade ore of 70 per cent iron content, but includes poorer ores needing concentration, as well. The cost of mining and transporting the ore to the furnace mouth is said to be less than Y.2.50 a ton while the coke costs considerably less and the limestone is under 50 sen a ton in the furnace. This puts the Penchihu plant in an exceptional position as regards cost of finished product and with improvement of methods that are at present somewhat less economical than those prevailing in other plants, pig iron probably will be produced at a lower price than in some larger but less well located plants.

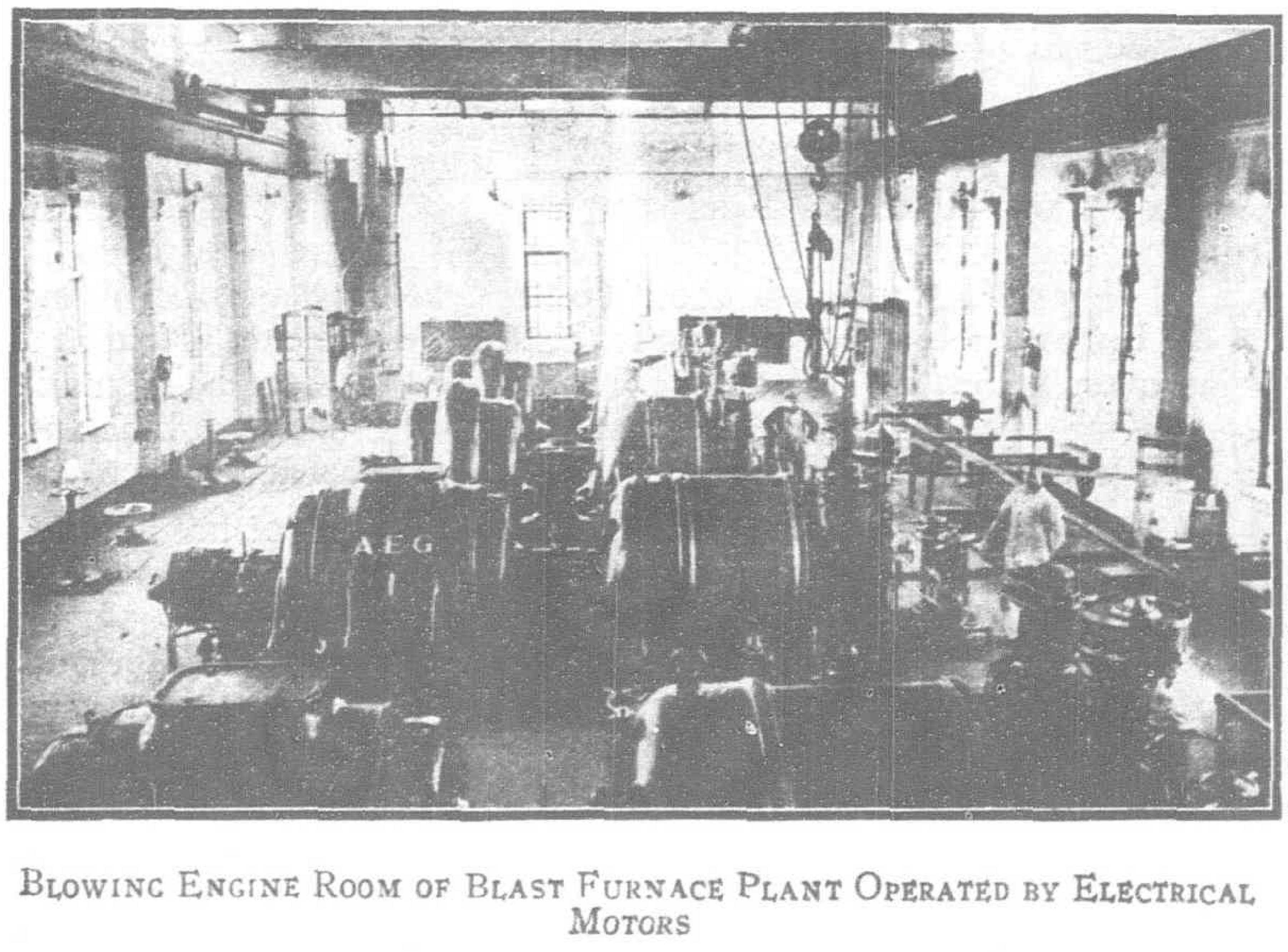
In the Manchurian plant, the iron ore lies less than six miles away from the furnaces, which are located at the mouth of the coal pits and the limestone for the flux outcrops near-by, so that the original costs of material at the blast furnace stacks can be kept low.

Credit must be given Baron Okura for instantly perceiving the advantage that would result from turning the coal into coke and using it to smelt the iron, and while no mention is made in the company's reports of the use of the blast furnace gases for the generation of electricity, no doubt these improvements will come in time and the costs of production will be materially reduced. The modern practice in the United States is to use the lean blast furnace gases for power and the richer ones from the coke ovens for manufacturing steel by the open-hearth process.

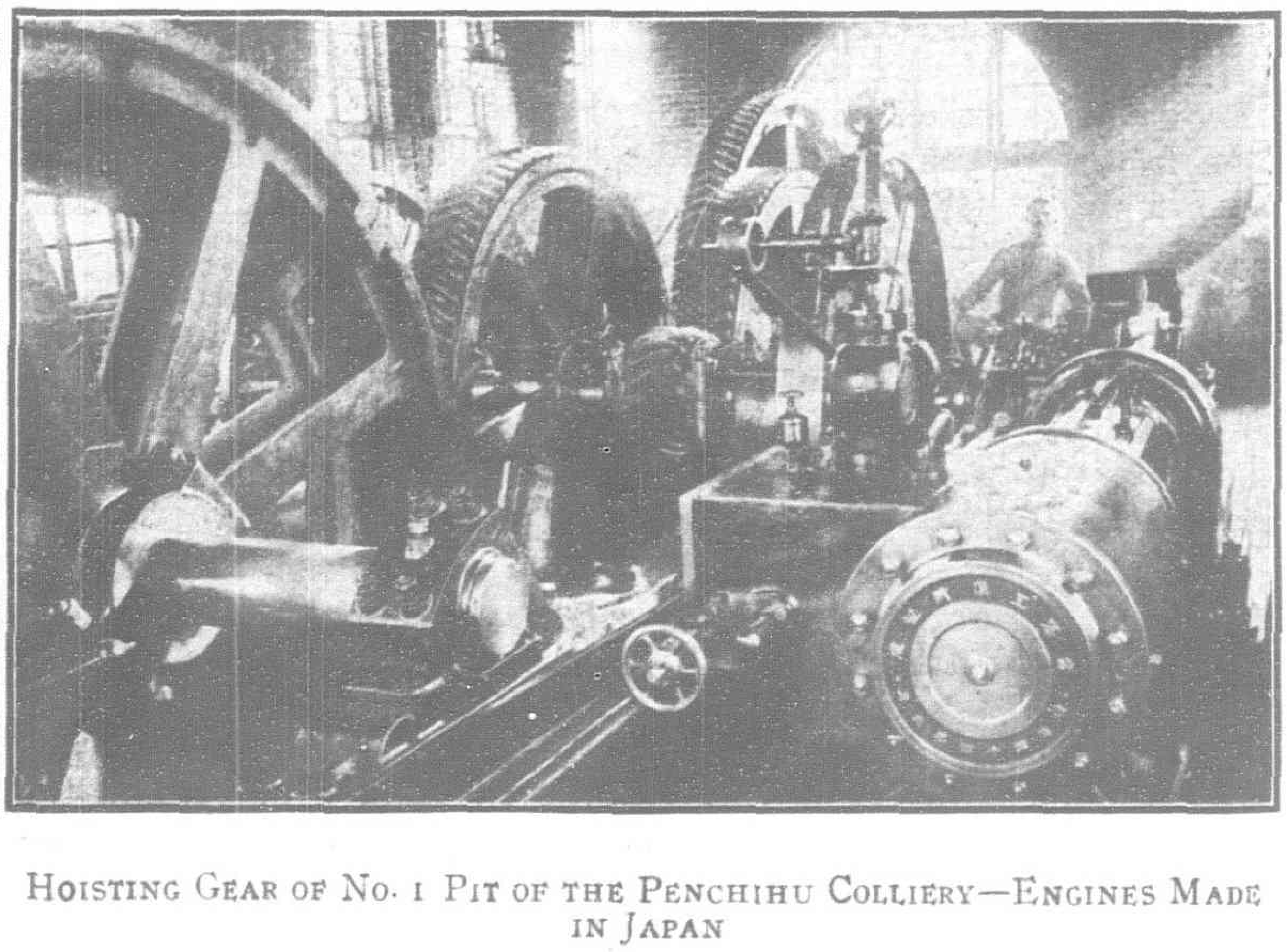
As the finished pig iron contains some three per cent of carbon and a like amount of silicon, while steel for general purposes contains less than one per cent of the two combined, a saving of five per cent in freight charges will be made by turning the iron into the finished product. The work of erecting the steel furnaces has not yet been begun, but the plans are drawn, and as their operation will effect a considerable saving if only in freight and by the use of gas that now goes to waste, it is expected that the foundations soon will be laid. As it is now, the entire output of the two Penchihu furnaces, which ranges between 220 and 260 tons a day, is being shipped to the Japanese Government Steelworks and there used with Japanese pig iron and other materials of Japanese origin, for steel making.

To Make Steel Billets

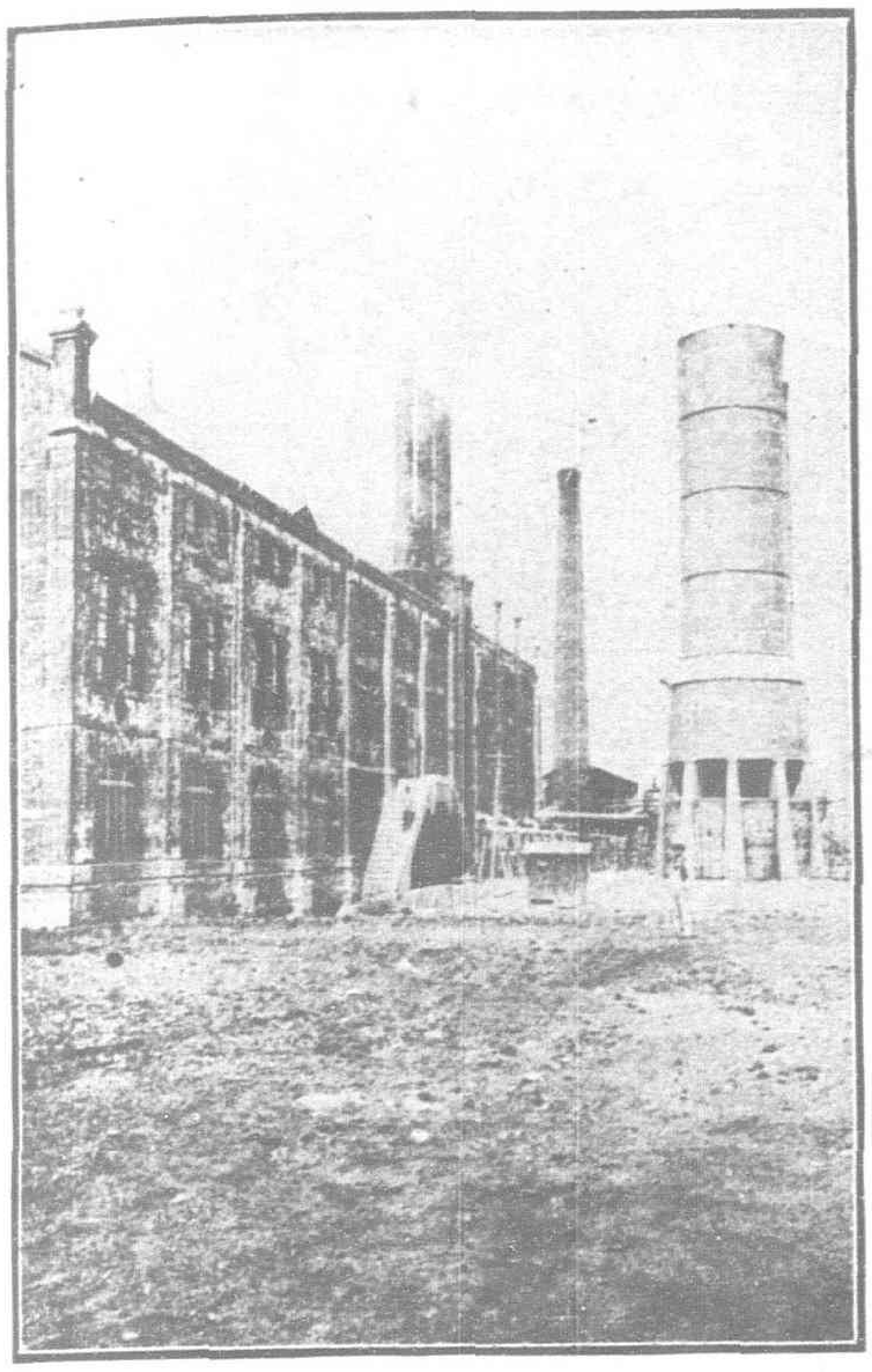
In the matter of rolling mills for turning the steel into plates and shapes for immediate use, no plans have been announced by the Penchihu company, which probably will confine itself to the simpler forms of steel such as slabs and billets. The operation of rolling mills for rails and other finished shapes could be carried on more economically at some of the works in Japan as the output of the Penchihu works even with three blast



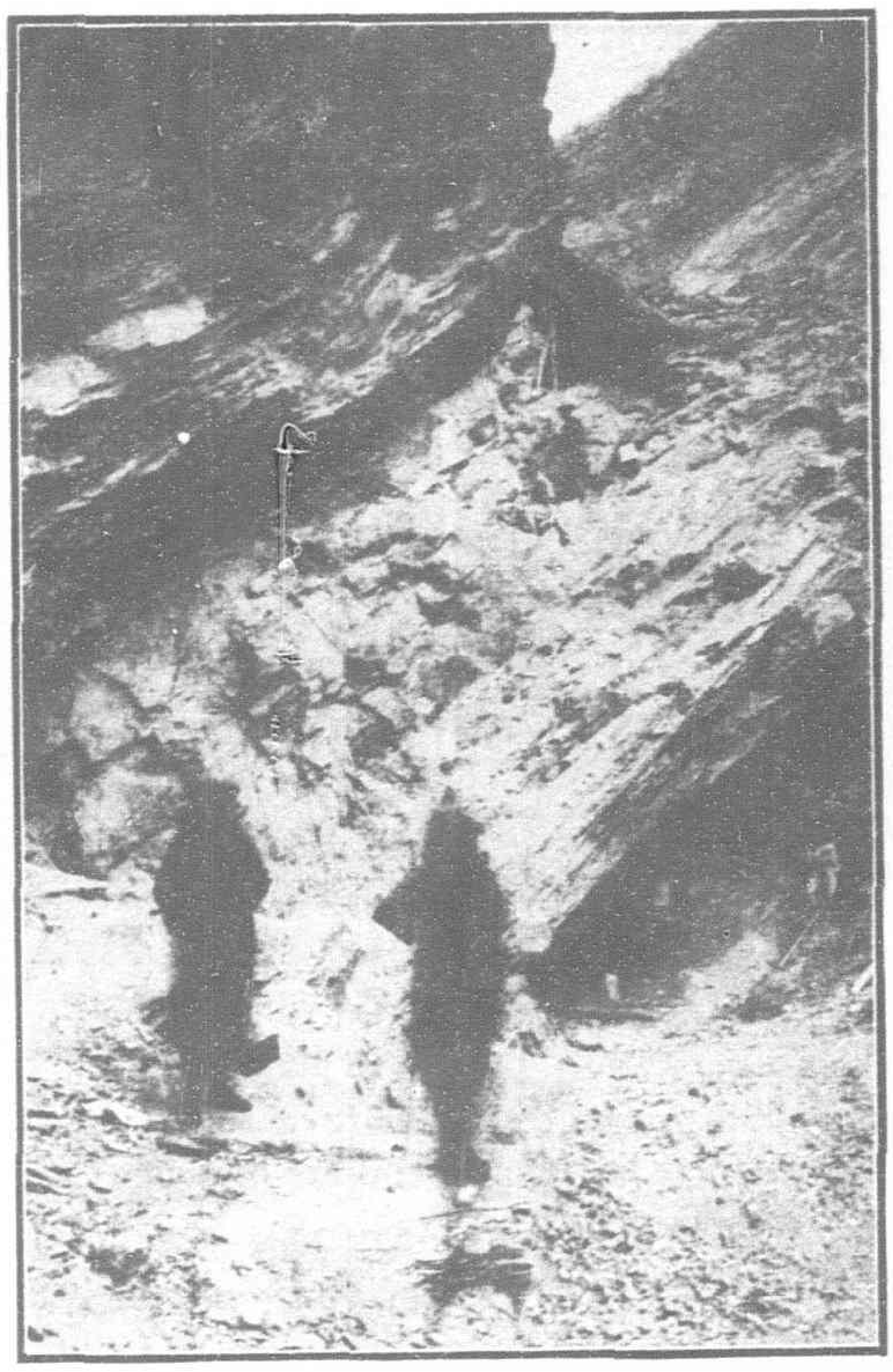
Blowing Engine Room of Blast Furnace Plant Operated by Electrical Motors



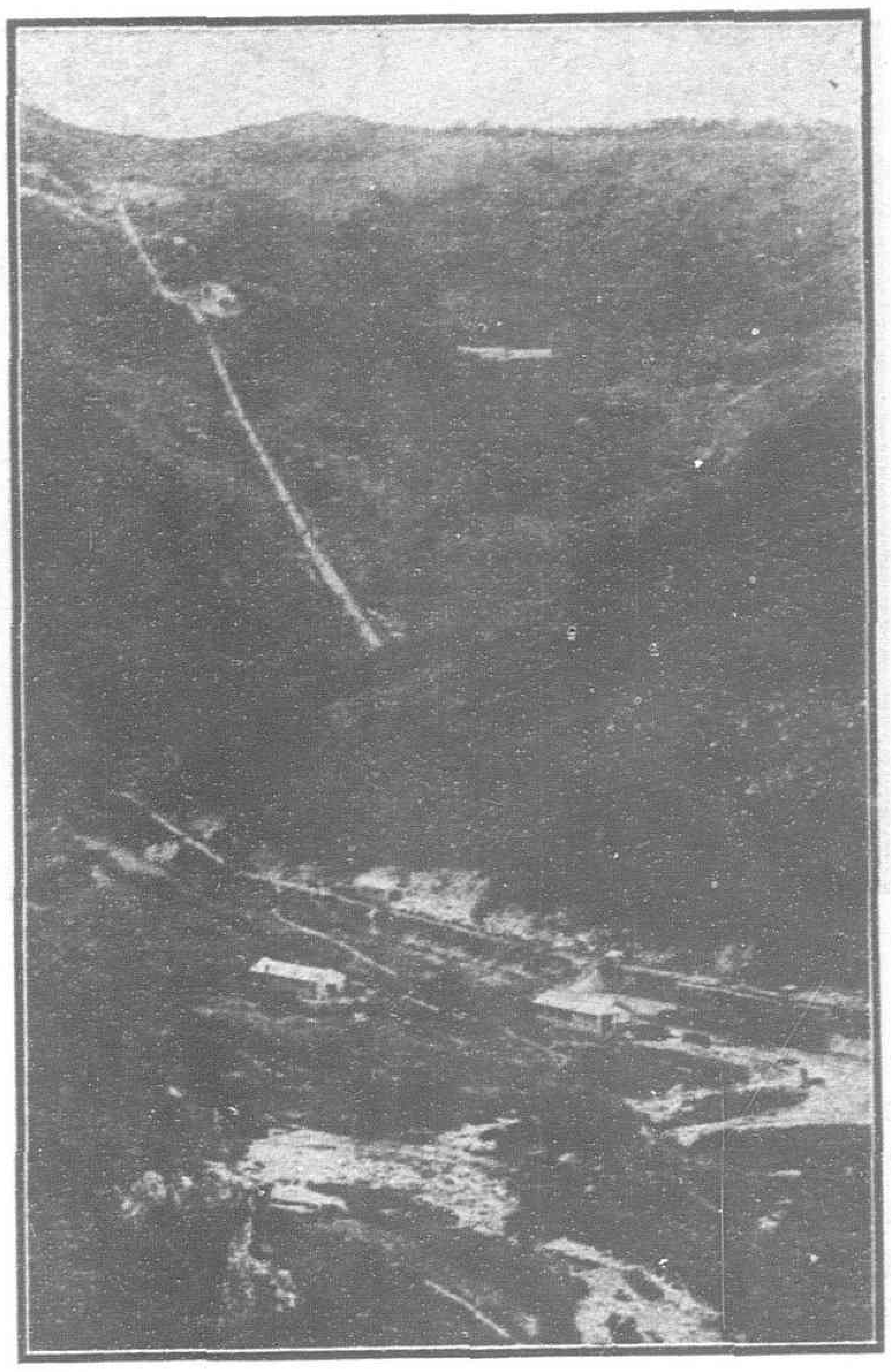
Hoisting Gear of No. 1 Pit of the Penchihu Colliery—Engines Made in Japan



Exterior of Electrical Power Plant



Face of Cut in Iron Ore at Miaoehrkou



Ore Loading Station for Miaoehrkou

furnaces and the requisite tonnage of steel plants would not be large enough to warrant much diversified manufacturing. For the present, the blast furnaces, and for the immediate future, the open hearth steel plants, are the limits of this enterprise, although the mining of coal will be carried on more extensively than the actual needs of the blast furnaces since the coal fields are within 124 miles of Antung, 146 miles from Yingkou, and only 283 miles from Dairen, from which ports coal can be exported at a profit, although Kyushu coal mined at tidewater might be able to drive the Penchihu product from the market in case a glut of coal came upon the market, a possibility that now seems to be growing more and more remote, owing to the increasing demand of Japan's industries for fuel.

The following is a recent description of the Penchihu coal seams and methods of mining, compiled from Japanese reports:

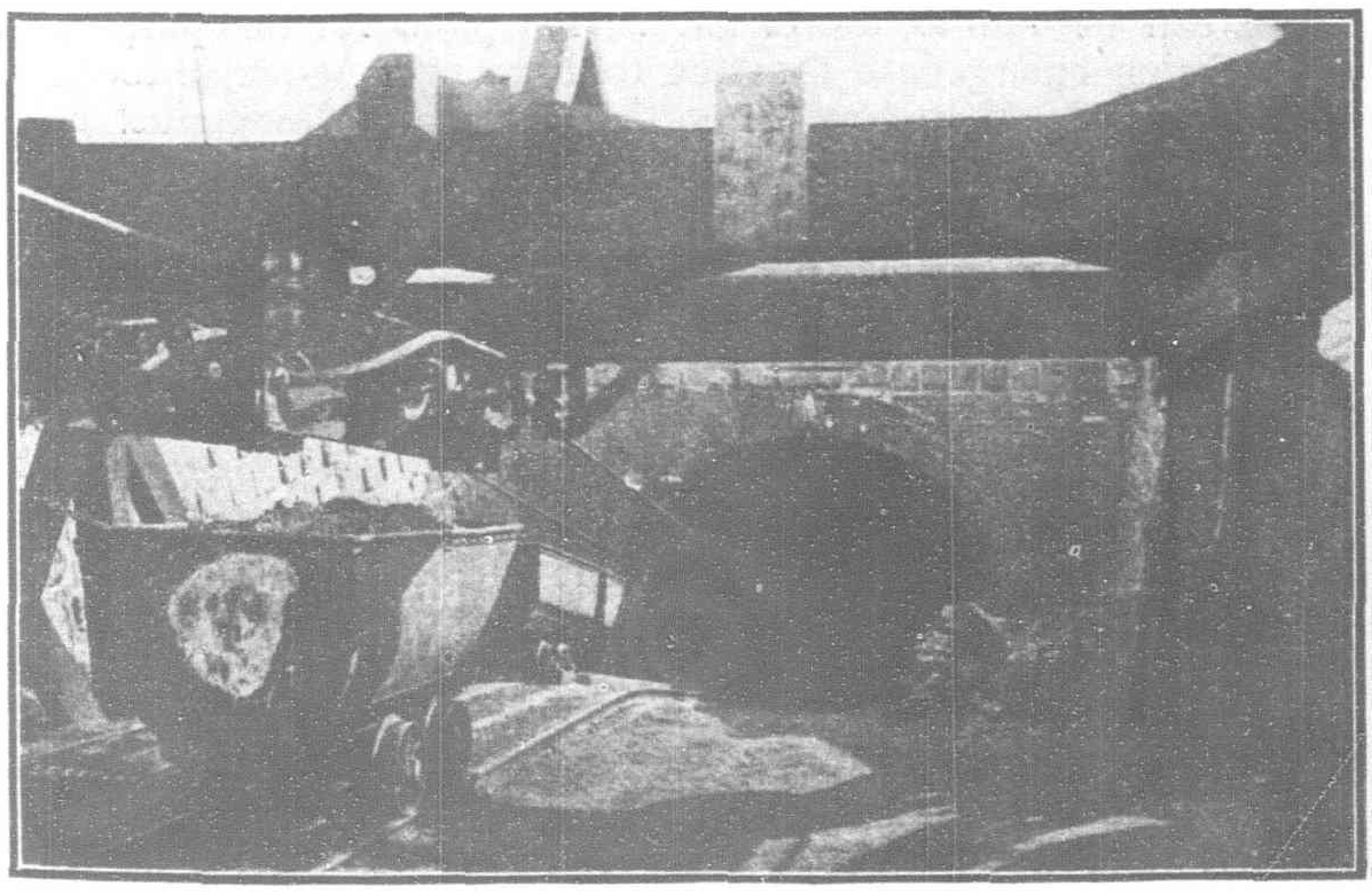
The Penchihu Colliery

The Penchihu coal field lies near the Mukden-Antung Railway at the northeastern fringe of the town of Penchihu, and extends over an area of 11,560,000 tsubo (9,444 acres). The coal seam is from 500 to 550 feet thick, interspersed with 17 layers of coal of varying thickness. The bottom of the seam lies on a stratum of sandstone, about 30 feet thick, supported by shale of about the same thickness. Sometimes marl is found underneath this. Its lower part is constituted with limestone crinoidea.

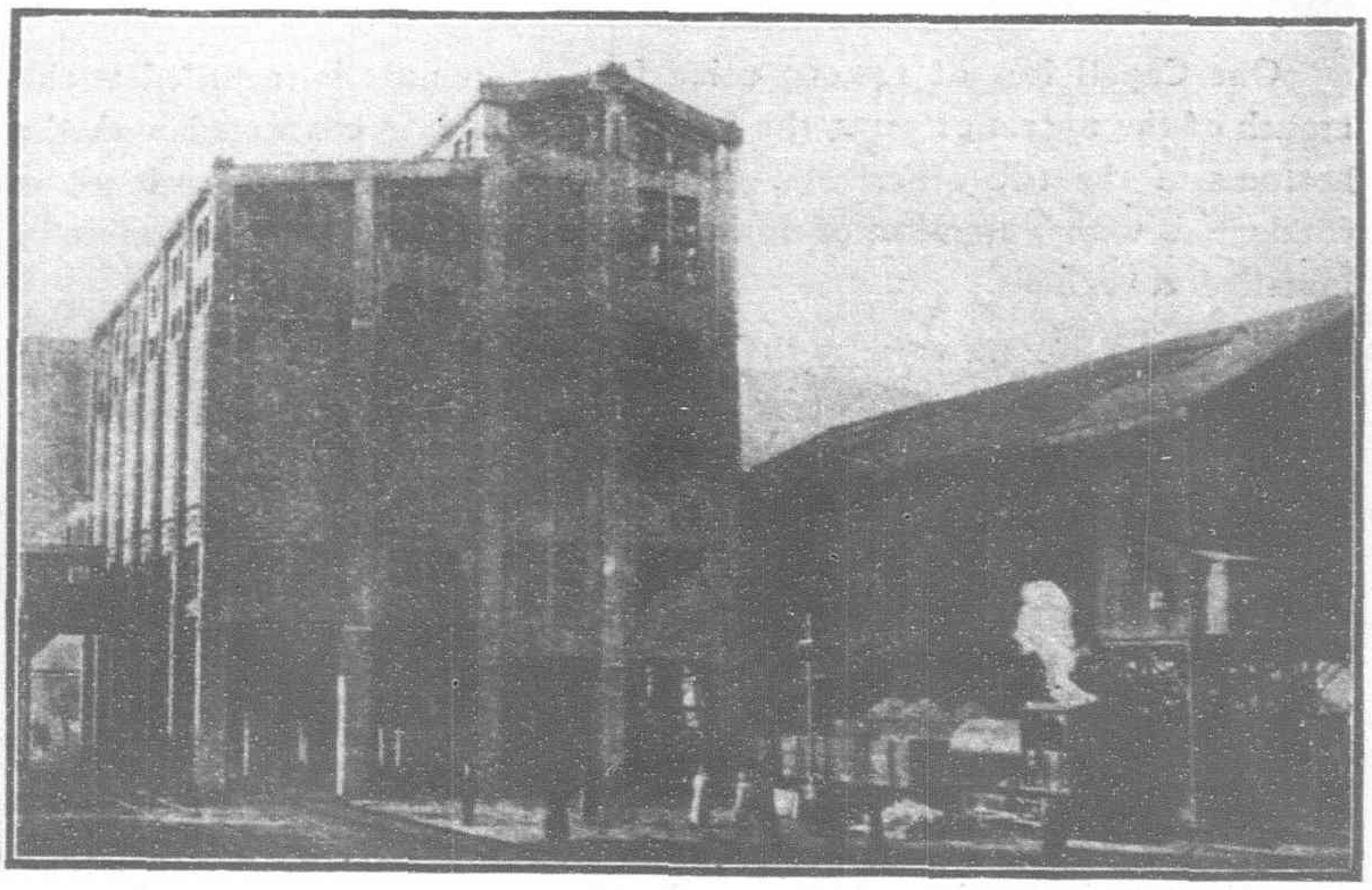
Out of the 17 layers of coal contained in the seam, those marked out *for future exploitation consist of the following: Paocha, 7 feet thick;* Hsiangtuan, 4½ feet; Choucha, 3½ feet; Ihsiching, 5½ feet; Erhhsiching, 9 feet; Sanhiching, 3 feet; Ssuhsiching, 3½ feet; and Wuhsiching, 4 feet; total thickness, 40 feet. The dip is about 15 degrees in the upper part and is nearly 30 degrees at places.

The mining of the Penchihu Colliery was commenced in January, 1906. The coal seam was struck at the depth of about 200 yards. This is called pit 1 and is for mining the three uppermost layers, Paocha, Hsiangtuan, and Choucha. The digging of a new incline with the aim of mining the lower layers was commenced in November, 1907. The excavation of the third pit was started in 1910 in order to exploit the three upper layers running west of pit 1. The coal vein was reached in July, 1912. The downcast of pit 2 is 310 feet deep, with a diameter of 12 feet lined with brick. It serves the pumping and ventilation purposes for all the pits and inclines.

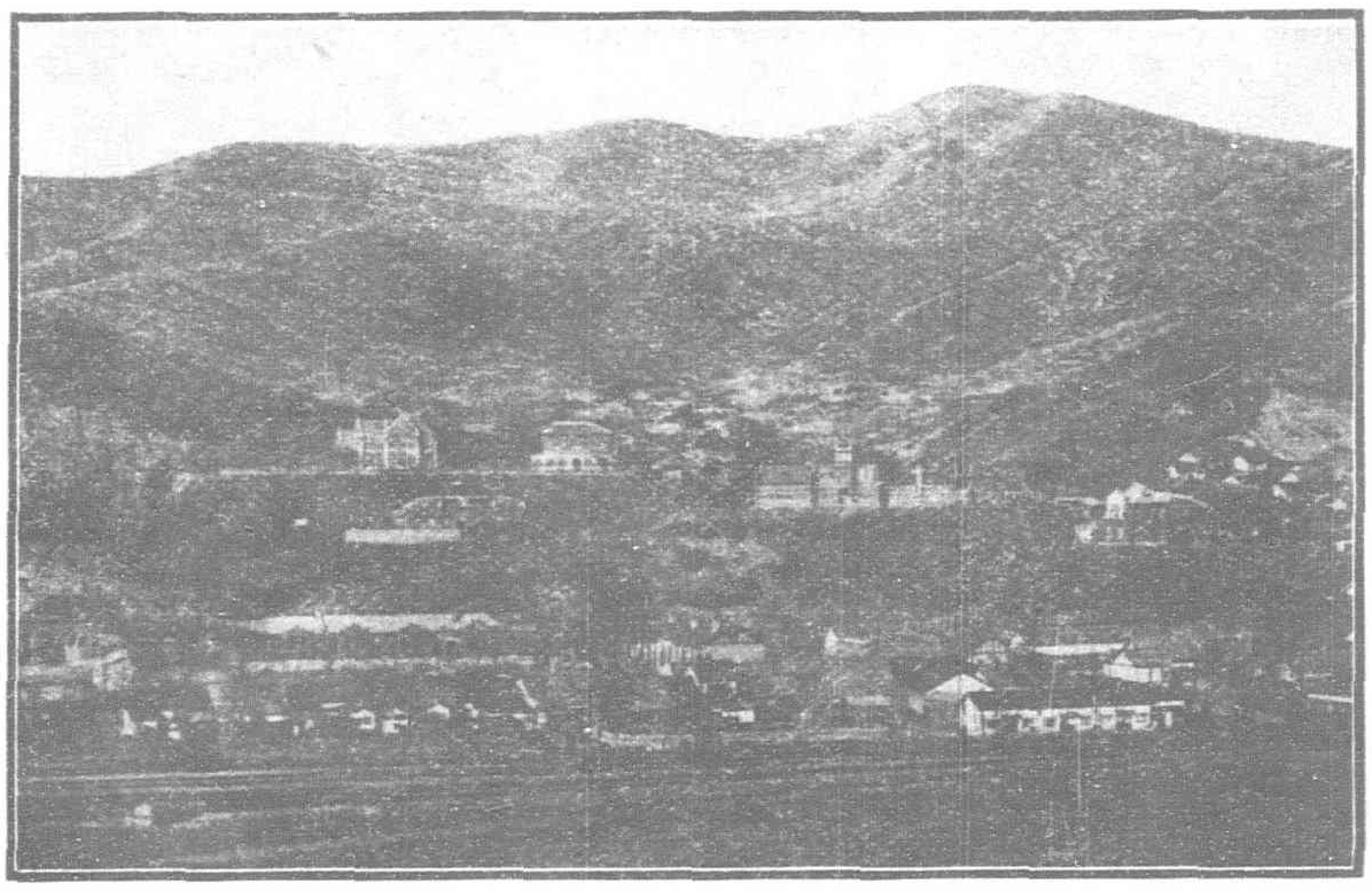
With the object of excavating a new pit at Ssuyenkou in order to tap that part of the coal seam which extends to the west of pit 3, prospecting experiments have been in progress. An experimental boring was begun



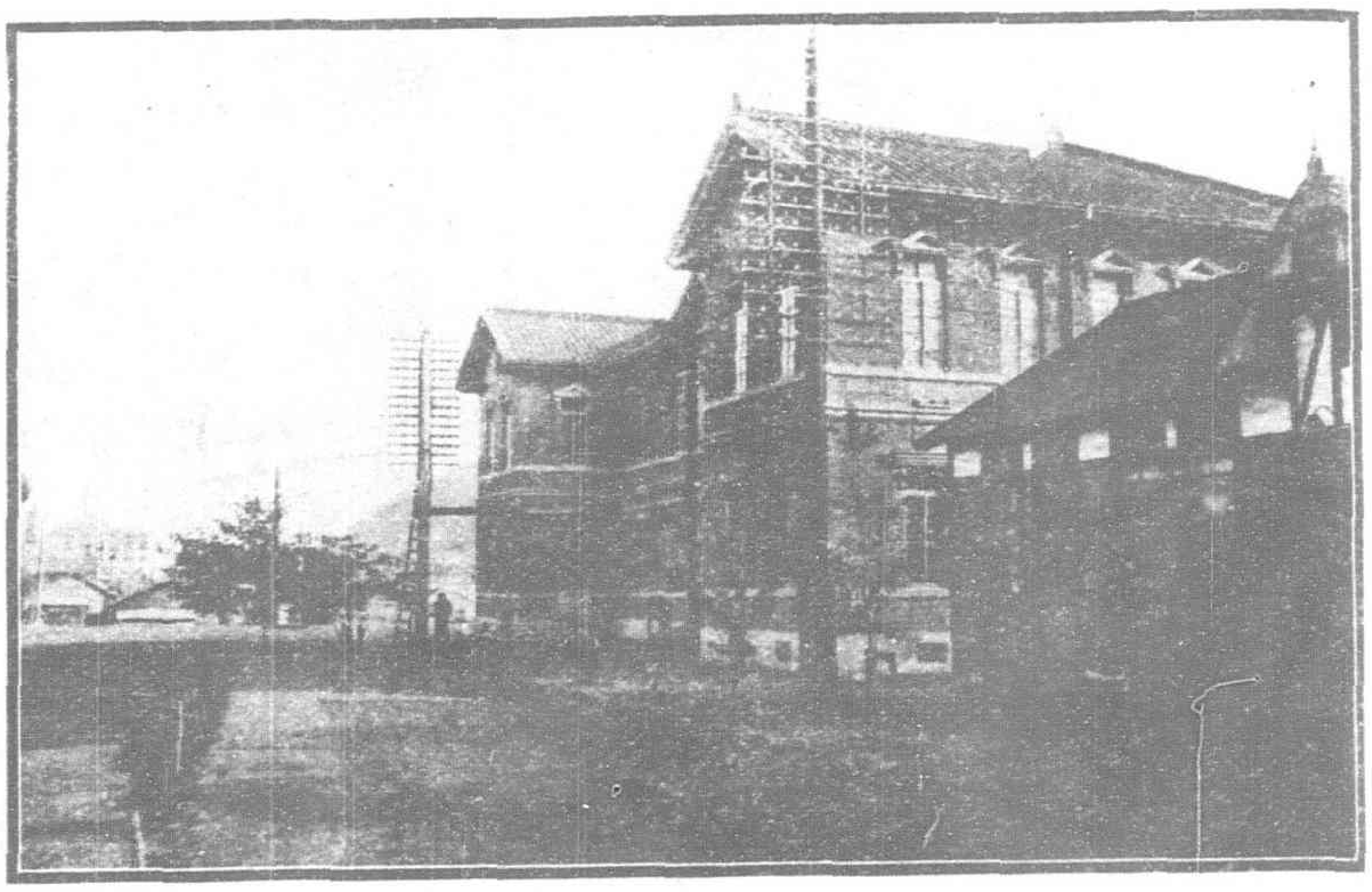
Mouth of No. 2 Pit at Penchihu



Coal Washing and Screening Plant



Clubhouse and Quarters of Japanese Staff of Company



Offices of the Colliery and Iron Works at Penchihu

at Paochiawatzu at about 3,000 yards southwest of pit 3 on August 10, 1916. The boring machine is operated by steam, and is capable of excavating 1,800 feet in depth. In pit 1 the ninth level is under excavation, the vertical distance between every two levels being 270 feet. For both the Hsiangtuan and Choucha layers in pits 1 and 3 the advancing stall system is used.

System of Working Coal

For the working of the Paocha layer a special system which may be designated as the combined system of pillars and stalls is employed. In pit 2 for the Ihsiching the stall system is used and for the Erhhsiching the pillars system. In the Erhhsiching the equipments were unsatisfactory and some improvement was under study. At length the application of the sand-flushing system was decided upon not only to the Erhhsiching, but also to the Sanhsiching and Ssuhsiching. The system is now in operation.

Twenty-five-pound rails are used for motor-driven haulages and hoisting and winding engines. Twelve-pound rails are employed in the levels. For the purpose of conveyance between the levels and the working places, troughs made of steel plate are used in pit 1, which has a gradient near 30 degrees. In pits 2 and 3, in which the gradient is about 18 degrees, baskets and sleds are brought into service. Coal cars are made of steel and each has a capacity of 6 tons. They are of the roller-bearing system.

Equipment of Pits

In pit 1, the cross compound endless-rope engines were converted into a motor-driven type with a speed of 120 feet per minute. In pit 2 a motor-driven double-drum endless-rope winding machine with the speed of 150 feet per minute is employed. In pit 3 a machine similar to that of pit 2 is used. The coal carried out of the pits is transported to the screening plant by means of endless haulage.

One Capell fan of 140,000 cubic feet per minute is installed at the mouth of the upcast of pit 2, the bottom of which is connected with the bottoms of the two other pits. The interior ventilation in each pit is conducted with a number of fans each of 1,000 cubic feet per minute, installed at each pit.

Clanny lamps are used by the miners and Davy lamps by officials. The interior of the pits is lighted by electricity. In order to insure safety, 50-volt distributing voltages are used.

In South Manchuria the rainfall is decidedly smaller than in Japan. As a consequence, the mine water is comparatively small in quantity. However, at Penchihu, there are numberless old pits dug by the Chinese some hundreds of years ago. On this account, in the rainy season, the rain water is naturally gathered in these old pits and filters into the pits under operation. The pumping is done by electric turbine pumps.

Electric current is supplied to all the pits to serve as the motive power as well as for lighting, both on the surface and underground. The overhead wires from the central power plant connect at the mouth of each pit with the shaft cables running into the interior of the pit. The shaft cables are fastened to the mine timber by means of cable cramps, and are of a paper-insulated, red-covered steel wire-armored pattern.

Not only is all the material used in the plant of Manchurian origin, but the plant itself, so far as the new furnace is concerned, was made in Manchuria. The Shakako shops of the South Manchurian Railway undertook the casting of the iron and steel work for the furnace and completed this so successfully that future furnaces and hot blast stoves, of which there are three for each furnace, doubtless will be built there. Great credit has been given the management of the Shakokou shops for completing this work so rapidly, as it was feared that the furnace would be greatly delayed, owing to the inability of other plants to undertake the castings. The furnaces are of the customary design and present no new features. The furnaces are 88 feet high and the diameter is 11 feet 1½ inches at the mouth, while the hearth is 9 feet 10 inches across.

The furnaces used to heat the blast are of triple McClure type each 20 feet in diameter and 90 feet high being surmounted by a 70 foot stack. The intake for air is at the top and the waste heat of the blast furnace gases raises the air current to a high temperature before it is admitted to the tuyéres above the blast furnace hearth. The blowers operate at 2,500 revolutions a minute and furnish 720 cubic meters of air at a pressure of six pounds to the square inch, taking 840 horse power for blowing each furnace blast. The plant is also equipped with dust collection apparatus that screens the furnace gases before they pass into the flues of the stoves for heating the air blast on their way to be burned under the boilers of the power house.

The plant as now operated is not complete, for the economical manufacture of pig iron, let alone steel, since the leaner ores of Miaoechrkou require magnetic separation and briquetting before they can be fed to the furnace. The plant for this purpose is now being enlarged so that the tonnage may be ample for both furnaces. Another very important adjunct is byproduct coke ovens and these are now being designed. The modern practice of steel making requires that the rich gases from the coke ovens be used to heat the open hearth furnaces while the surplus of poorer gases from the blast furnaces is sent to gas engines which supply power for the plant or are burned under boilers of the necessary steam plant. These ovens will be ready for operation by the time the steel furnaces are erected.

It is understood that the coke ovens now being designed will be of the most improved type possible and that benzol and other hydrocarbons useful for munitions and dyestuffs will be recovered as well as the gas tar and ammonia. When the Penchihu plant is finally completed, Manchuria will have two centers for the production of ammonium sulphate so greatly in demand as a constituent of fertilizers, the other being at the Fushun coal mines. Baron Okura is sparing no expense in securing the most approved machinery for the Penchihu installation and it is expected to stand in the first rank of modern steel works.

A Grave Flaw in the Chinese Maritime Customs Service

A Plea for Reform of the Conditions imposed on the "Outdoor Staff," which is Underpaid and Overworked, lives in Discouraging Evironment and enjoys no Provision for Retirement or Old Age

The Chinese Maritime Customs, which employs in normal times more than 1,300 foreigners and more than 6,000 Chinese, is a picturesque institution that has been studied and written up from many viewpoints and which always affords fresh material for either the impressionist or the serious student of tariffs and ways of collecting them. Among the foreigners employed are men of twenty nationalities. They are stationed in all the degrees of latitude over which the territory of China extends; they collect for the Chinese Government more than seventy million taels a year, not much less than the entire magisterial system sees fit to remit from the great land tax which was formerly the backbone of China's revenues; and they work under a system which is semi-independent of Chinese jurisdiction, being immediately responsible to a foreigner, an Inspector-General in Peking, who by virtue of an assurance given Sir Claude Macdonald in 1898 by the Tsungli Yamen (the then title of the Chinese Foreign Office), is a Briton and will continue to be a Briton as long as the British Empire has a predominance in Chinese commerce. All this has been frequently told and is well known to every one who has any reason to be interested in the Chinese Customs, but quite recently the Customs Service has become the subject of discussion and in some instances of very bitter criticism in contributions to the press, and this discussion is from a new angle and a new point of view—the point of view of the great majority of the employees of the Customs, who are officially grouped in the "Outdoor Staff."

For many years every resident in the Far East has heard from individuals and groups of men in the Customs service, expressions of a vague discontent, charges of unfair discrimination, of lack of consideration on the part of the more favored "indoor staff." of inadequate pay of discouraging living conditions, of overwork, and of heartless and inconsiderate dismissal in old age. Every one in China has heard the charge that when the foreign founders of the Chinese Maritime Customs set about shaping a system more than sixty years ago, they decided to shape it along Chinese lines, to separate the work into two distinct classifications.—that done by the foreign gentlemen, and that done by the other foreigners' coolies, and to deal with the men who fell under either of these classifications as one dealt with gentlemen in the first instance and as one dealt with coolies in the second instance. While the organization may not be very democratic, this story in itself is undoubtedly a fable, but it serves to illustrate the character of the complaints that have been current until very recently, when definite and tangible statements of salaries received, systems of promotion employed, working conditions, living conditions, and conditions of retirement, have made it apparent that, whether or not the shabby treatment meted out to the members of the outdoor staff is a part of the founders' deliberately planned system or not, the treatment is unworthy an institution which is so efficient and which yields such handsome returns to the Chinese Government, and should be greatly improved, now that the Government is about to profit by the revision of the tariff and by the remission for a period of the payment of the Boxer Indemnity installments, for which the Customs revenue is security.

This prospective increase in the Government's income has undoubtedly inspired much of the publicity which the members of the outdoor staff of the Customs Service have been giving their grievances and their demands for more considerate treatment The Chinese Government has complained for many years of the unjust restriction which prevented the Customs from realizing the effective five per cent ad valorem on imports guaranteed them by treaty, and the Allies have, by joint action, determined to right what was manifestly a wrong. The members of the outdoor staff of the Customs Service have also been complaining for many years, and they are undoubtedly justified in thinking now that since the Chinese Government has adjusted its difficulties and is about to profit handsomely, it is an appropriate season for applying the same principles of justice and fair play to the employees of the service and for ameliorating their condition.

In the Boxer Protocol, signed in 1901, the Customs import tariff was fixed at five per cent ad valorem, and for convenience the values taken as a standard were the result of investigations made in 1897, 1898, and 1899. This arrangement was confirmed by a Chinese-British treaty the following year, and since a readjustment of values and a revision of the scale of tariffs entailed securing the consent of all the Powers which were party to the Protocol, they have never been revised, and the Chinese Government has been taxing imports according to prices of goods which prevailed twenty years ago. It has been estimated that the loss during recent years amounts to three tenths of the effective five per cent duty, and that a revision would increase the Government's income by three sevenths of the present seventy million taels. Several attempts by the Chinese to obtain general consent to a revision were opposed by the Japanese Government influenced by the Japanese cotton, piece goods, and hosiery manufacturers, but when, after China's declaration of war upon Germany last August, the representatives of the Allied Powers were again reminded that the present valuation of imports was archaic and that its revision was urgently required, Japan came into line, and a commission, Chinese and foreign, has already been appointed to revise all values so that China may realize an effective five per cent.

The thought that one thirtieth of the added revenue, excluding from consideration the released funds that would normally go to pay installments of the interest and principle of the Boxer Indemnity, would double the salary of every man on the outdoor staff, and that less than another thirtieth would provide pensions for all ex-members of the staff still living, who have been retired on account of sickness or old age, naturally inclines any impartial observer to sympathize with the complaints and requests of the hard-worked and underpaid "outdoor men," who, if they are not worth more than they get, are certainly not worth retaining at all. It needs to be impressed not only upon the Chinese but upon the foreign directors of the system, that the customs service is of such importance to the Chinese Government that its work should be done by competent and intelligent men, that competent and intelligent men will not enter the service which starts all recruits at the bottom, and on a salary that would be scorned by any schoolgirl stenographer in Shanghai, unless they are stranded, and that the intelligent recruits who enter the service because it insures food and lodging for a time do not stay. The Customs is a big business, and since it is recognized that the employment of cheap incompetents is no saving but bad business in any line of commercial work, it must be impressed upon the Customs Inspectorate that the wage and treatment accorded the outdoor staff, who are not incompetents, is bad business and will not pay.

To come to the concrete causes of complaint, one can sum them up in a paragraph. The pay is too low for all classes. Pay increases with promotion, which is slow and is not in any way systematized, so that the preferences of immediate seniors, unjust discrimination, or conditions of service, may keep a faithful and competent man in a subordinate position, drawing a salary which does not permit of saving, of marriage, or the acquisition of any property, for the period of his natural life. Living conditions are bad. The quarters provided are in nearly all instances unfurnished, unheated, and often either insanitary or close to or in an insanitary neighborhood. The living allowances granted married men are wholly inadequate, based, like the Customs tariff, on values and rents which prevailed a generation or more ago. Hours are long, men who suffer from trying climatic conditions and exposure are worked twelve hours a day, have few holidays, and when the service requires that these be sacrificed, there is no compensation. Men are continually being transferred. The allowances for traveling expenses are not sufficient, and in the majority of cases a man who is shifted to another station finds it cheaper to sell all his possessions and replace them in his new station, than to pay transport on his essential funiturre. In the same way the allowances for home are inadequate so that many men live their lives in the Orient and die in the service without returning to their native lands because they cannot afford to go when the opportunity is afforded. There are no pensions, there is no retiring age, no stipulated period of service. A man quits, dies, or is discharged on account of old age, and receives no pension in any event beyond periodical service gratuities, which, even if well invested, would not yield an adequate income after retirement. Marriage is in most cases apparently discouraged, the Inspectorate looking with disfavor upon all alliances contracted until after many years of service. The result of this is, in far too many instances, the contraction of illicit alliances and of occasional immorality, as so many of the Ports are quite devoid of proper society within reach of the Outdoor Staff, and the consequent deadly loneliness forces the men into undesirable alliances.

The minimum salary in the Customs Service is 75 Haikwan (Customs) Taels per month and the highest salary paid is 500 Haikwan Taels a month. The former is the salary of a novice, a probationary tidewaiter, while the latter is the maximum paid to a chief tide surveyor, a man of not less than thirty years' service. At a normal, pre-war exchange H.K. Taels 75 was the equivalent of a trifle over Gold $50 or £10 sterling, and H.K. Tls. 500 was the equivalent of a trifle less than Gold $35 or £70 sterling. At the exchanges which have prevailed for a year or more the tael has been worth as much as and at times more than the American dollar, but it has bought less instead of more in China and its high gold value is no consolation to men who have nothing to save and therefore nothing to send abroad.

Under the living conditions that prevail in China, which entail the employment of servants, the provision in most instances of a separate cooking and living outfit for each man, since cheap hotels and boarding houses only exist in the largest ports, and good clothes, since there is no acknowledged "laboring class" among foreigners in China, no man can live either respectably or comfortably on Tls. 75 a month and if one is expected to live respectably and maintain his self-respect and at the same time save, say one tenth of his salary, he must be paid a minimum of Tls. 150 a month, a salary which is attained in the Customs after an average service of thirteen or fifteen years.

In other words a man entering the service, which is exacting and strict, is asked to live in comparative poverty, to live in a manner which precludes social intercourse with foreigners outside the circle of his fellow unfortunates, precludes the enjoyment of ordinary amusements and pleasures, for at least thirteen years, and since there is no recognized system of promotion he is not sure that he will have a living salary even at the end of thirteen or fifteen years. It just happens that most people do.

When a man enters the service, between the ages of twenty-one and thirty, he serves six months at the novice's salary and is then, if recommended, given the rank of a third class tidewaiter and a salary of Tls. 90 a month. After receiving Tls. 25 for his first uniform he is told that all subsequent uniforms he must purchase himself, an outfit for winter and another for summer, he is sent to his first station, given quarters and proceeds to furnish them, must hire a servant, buy a mess outfit, and provide fuel and light out of his own pocket, and hire a teacher if he cares to study Chinese. A man who has served six months as a probationist and has given good service is fairly sure of getting his rank of third class tidewaiter and his Tls. 90 a month; after that he is sure of nothing, and for the next twenty or thirty years is encouraged by the haphazard way in which a few men are pushed forward, receiving promotions and increases of pay with dazzling frequency, since this spectacle, like the chance in a gamble, sustains a man and prompts him to cling to his job against his better judgment, always hoping for a stroke of luck.

An examination of all the service lists published since the establishment of the Chinese Maritime Customs, will give no clue to the system of promotions. Length of service seems to have nothing to do with it. Achievements in the service have as little. Men in the same class, of equal ability and equally good records, may differ in term of service as much as twenty-five years. There is one station in China where a man has reached the rank of boat officer in three years, while subordinate to him is a man of the same rank who has served thirty-five years.

All juniors in the service who have not done ten years and have not been classed as executive or non-executive employees, must do both day and night duty by turn, spending much of the time out of doors, exposed at times to intense heat or cold, working in the holds of ships among crowds of unwashed and diseased coolies for periods varying from eight to twelve hours a day, never more than the latter, however, with Sundays and holidays only so often as the number of the staff in the port permits, holidays also being taken turn about.

Men who have served ten years are classed by the Inspectorate as executive or non-executive, according to their records and their reported capabilities, and the members of the examination, or non-executive staff are never called upon for night duty and have somewhat shorter hours.

Men who have seen service at sea, either as seamen or deck officers are sometimes given preliminary executive work, leading up to the ranks of tide surveyor and harbor master, but beyond these uncertain clues and steps to promotion there seems to be no definite system, and in making a table of salaries and service, one must make scores of exceptions and choose cases that are somewhat similar so that averages can be struck.

The following is as fair a table, showing the relations between rank, service, and salary, as can be made up from the service lists, and we are sure that if it were shown any recruit who seriously contemplated entering the outdoor staff of the customs as his life work, it would be sufficient to deter him.

Rank	Pay Per Month	Period of Service
Probationary Tidewaiter	Tls. 75	6 months
1st class ,,	,, 90	6 ,, to 6 years
2d class ,,	,, 100	6 years ,, 8 ,,
3d class ,,	,, 110	8 ,, .. 10 ..
Assistant Examiner B	,, 130	10 .. ,, 13 ,,
Assistant Examiner A	.. 145	13 ,, .. 16 ..
Examiner B	,, 160	16 ,, .. 19 ,,
Examiner A	,, 175	19 ,, .. 21 ,,
Chief Examiner B	,, 200 to 225	21 ,, .. 24 ,,
Chief Examiner A	,, 250 to 300	24 .. ,, 26 ,,
Appraiser	,, 325	26 ,, .. 30 ..
Chief Appraiser	,, 350 to 400	30 ,, and upwards

Men who are drafted into the executive branch of the service are usually promoted from the rank of first class tidewaiter, and as executive officers their salaries bear the following relation to service on the average:

1st class Tidewaiter	Tls.	110	8 to 10 years
Senior ,,	,,	130	10 ,, 13 ,,
Acting Boat Officer	,,	150	13 ,, 15 ,,
Boat Officer	,,	160 to 200	15 ,, 18 ,,
Assistant Tide Surveyor	,,	225	18 ,, 22 ,,
Tide Surveyor	,,	275 to 350	22 ,, 30 ,,
Chief Tide Surveyor	,,	400 to 500	30 and upwards.

In the early part of 1917 the dissatisfaction with the salaries paid, the system of promotion, and the living conditions became very marked, probably because there has been a marked rise in the cost of many essentials during the past three years, and there were so many resignations from the out-door staff that the Inspectorate felt bound to make some conciliatory move. There formerly existed the junior rank of "watcher," with the salary of Tls. 50 attached. This was abolished to make the service more attractive to recruits and the prospects of candidates for the "examiner" class was improved by dividing the examiner and chief examiner ranks into examiner A and B, and chief examiner A and B. The manifest purpose of this step was to conciliate and hold a valuable class of senior members and to attract new recruits. The great majority of the junior officers found their status and their salaries unaffected and their living conditions were not improved in any way.

Dissatisfaction was if anything keener than before and anonymous letters began to appear frequently in the press. A circular from the Inspectorate described the apparent unrest in the service as the result of agitation, expressed the conviction that the complaints were founded upon imaginary evils, pointed out that food was cheap in China, that salaries were not so bad, and remarked that there were a lot of undesirables in the service who could readily be dispensed with. This of course did not improve matters, and the common retort was that if there were a lot of undesirables in the service that the Inspectorate had to look to the cause, since no business organization ever gets better service than it pays for. Since conditions have not improved, feeling has not improved, and now that the Customs is about to profit very handsomely through the diplomatic arrangements made with Powers, the men are justified in looking forward to a serious consideration of their unsatisfactory conditions and a systematic attempt to improve matters. The major complaints are still low salaries, poor living conditions, and unsystematized promotion. There are many minor complaints as well, and some of those which seem particularly well grounded are worth giving in detail.

The need of providing quarters for the employees was recognized by the founders of the Customs Service sixty years ago and some provision has always been made, because in many stations foreigners are very few and there are no procurable houses adapted to the needs of the members of the staff. The system instituted at the beginning has not improved, however, as the Service has aged and expanded. Quarters are still provided for the unmarried men, but they are not always either comfortable, adequate, or sanitary. Wherever they may have been when they were originally built, too many of them are now in the heart of native settlements, where, if the quarters themselves are sanitary and well kept, the neighbors, whose dwellings press in upon the quarters, are often of the poorer classes, and among them filth and disease are always accumulating and always becoming a more serious menace as the populations grow. Whatever the quarters may be, they are in the majority of cases unfurnished and unheated and a junior officer taking up his work in a new station has either to bring with him all the furniture, cooking utensils, bedding, and stoves needed to set up housekeeping and then keep house, on a very small salary, or buy a complete new outfit every time he is transferred and sell out every time he moves—and not at a profit in any case. The questions of quarters and of transfers are problems for all, but as the unmarried man does not accumulate so much and can do with less, these difficulties are much more real and trying for the married man on an equally small salary. Quarters for the married are particularly inadequate and should be the particular care of the Inspectorate.

In most cases, under the present system, the married man, arriving in a new station with his family and belongings, finds that there is no room for him, so he is given a "house allowance" and is allowed to shift for himself. The "house allowance" varies in the different ports, but in all cases it was fixed many years ago when some of the big commercial centers were villages, and living and rents in all parts of China were only fractions of what they now are. The allowances were probably adequate at one time, enough to rent the kind of house in which a self-respecting man of ordinary qualifications would be content to house and raise a family. If this was ever true it certainly is not true now, for in nearly all ports the "house allowance" is not sufficient to pay for even poor quarters, and the man who is trying to raise a family on a salary that might have seemed fair enough to his grandfather, but which is always insufficient for his needs in this generation, must supplement the house allowance out of his salary to get a house to which he and his wife are thereafter ashamed to invite their friends. if they can afford to have any. Allowances vary greatly, but Tls. 10 a month is probably a fair average, and this is about enough to get three small rooms in an unimproved Chinese house in a middle class Chinese community. Such houses as are available are usually rented by the year, and the landlords in many communities insist upon the signature of a lease for one, two, or three years, with monthly or quarterly rent paid in advance. The employee, after leasing a house and furnishing it, therefore has almost invariably to break a lease when he is transferred and must pay compensation out of his own funds in addition to whatever loss he may suffer on the sale or transfer of his belongings.

The transfer problem is one of the most serious that an employee has to face, and here again the married man pays most heavily. When a man joins the service he is given to understand that he is liable to transfer at any time, to any station in China, and that he has preference in the matter which the Inspectorate will recognize. There is no system in this matter.

Some men are in one port twenty years while others move every six months. There are allowances for expense incurred in moving but like all other such allowances they are inadequate and most men find it cheaper to sell out every time they move and move with nothing rather than to pay freight. Under such conditions no employee can collect the articles of furniture really essential to a home that has any homelike associations.

In assessing freights on the China coast a package four feet each way is reckoned as a ton. It has been estimated that the clothes and bedding of two adults and three children usually amount to nearly four tons, reckoned according to this scale. It has been estimated that a man, carrying no more than his family and their clothes would spend $5 more than the traveling allowances on a short journey from Canton to Swatow if he made perfect connections at Hongkong and did not have to put up at a hotel anywhere. A man moving from Canton to Tientsin under the same lucky conditions would lose $30. Needless to say, the losses through sales and fresh purchases, the transfer of some furniture and hotel charges en route actually mount up to several hundred dollars in the case of a transfer, and it must be apparent that in a family that has to struggle to make ends meet and which never has any savings, such a loss, equivalent perhaps to the loss of two months' salary, is a real embarrassment. When such transfers come once a year or even once in two years they are a serious trial.

The moral of this of course is—Don't get married. That is what the Customs Inspectorate advises. But they also insist that the Service provides a life work for all its employees, so the logical conclusion is that it is a celibate institution and no children are the most welcome.

Although the Customs Inspectorate would have recruits believe that they encourage long and continued service, there are no pensions and there is no definite understanding about retirement. A man leaves the customs in his old age, whenever he is told that his services are no longer valuable, and that his resignation is wanted, and he leaves it with what he has saved after twenty or thirty years of hard work under trying conditions and with inadequate pay, and his savings are usually nothing. If a man joins when he is twenty-five and leaves when he is fifty-five with nothing saved, his end is not likely to be a bright one, for nothing is learned in the Customs that qualifies a man to go into any more lucrative employment, and in many cases, men who are dropped in this fashion and cannot get other employment in the East have not enough money to pay their passages home.

The only inducements offered to men to remain any length of time in the service are the home leave, the ten years' gratuity, and the bonusus for Chinese study. Home leave, which ought to be very attractive, is in reality the least attractive, and there are many men who serve their whole lives in the

Customs Service without taking leave, because they cannot afford to. After nine years and a half in the service a man may apply for home leave for three or six months on full pay, or a year on half pay. The second home leave comes after another seven years of service. After a man's return from home leave the Customs makes him a grant, which is supposed to cover the cost of his passage at sea to either Europe, America, or Australia. As a matter of fact, these grants do not cover the actual passage, whether for first class or second class, and, in some instances, do not amount to a third of the passages charged by the cheapest lines in 1916. The actual relation between transport costs in 1916 and the grants made is shown in the following brief tabular summary of six cases: three of bachelors; and three of married men with two small children each:

Bachelor 2d class to London, return passage—	
Cost of return 2d class	£60.10/
Service grant for " "	£30.00
Actual loss to A	£30.10/
Bachelor B, 2d class return to Sydney	
Cost of 2d class return passage	£46 16/-
Service grant for above	18 00
Actual loss to B	£28 16
Bachelor C, 2d class return to San Francisco	
Cost of 2d class return passage	£42 10/-
Service grant for above	30 00
Actual loss to C	£12 10/-
Married man A, 2d class return to London	
Cost of 2d class return passage	£138 76/-
Service grant for above	67 10
Actual loss to A	£ 70 17/6
Married man B, 2d class return to Sydney	
Cost of 2d class return passage	£105 6/-
Service grant for above	40 10
Actual loss to B	£ 64 16/-
Married man C, 2d class return to San Francisco	
Cost of 2d class return passage	£ 97 12/6
Service grant for above	67 10
Actual loss to C	£30 2/6

Besides making up the difference between the service grant and the actual cost of passage, a man usually has to allow for excess baggage charges, railway fare at home, and the usual living and traveling expenses while at home. It is not often that a man sees his way clear to go home at all unless he has contrived to save something. What most men who go home do is to wait another year, until the ten year gratuity is due and then apply, using the gratuity, which is supposed to take the place of a pension, to defray the expenses of a trip abroad.

The gratuity is twelve months' salary paid according to a man's substantive rank and not according to his acting rank. This usually means that a man finds himself after ten years and a half with a lump sum of Tls. 1,320 or Tls. 1,560. Sometimes it comes in handy to pay accumulated debts and lay in a stock of clothes and furniture. Generally it is spent on the home leave. A few men find it possible to put it aside and invest it, and by so doing assure themselves that after another twenty years' service, if they do not have to touch this hard, they will have an annual income of two or three hundred dollars a year or about what a respectable pension would give per month.

Since the Inspectorate does not expect a man to marry until he has had his second home leave, in other words until he has been seventeen and one half years in the service, and since very few men are permitted to serve more than thirty years, a man retired at the end of thirty years' service with a family on his hands has nothing but small children, the eldest not more than twelve years old, for whom he must be prepared to provide food, clothes, and lodging, and pay school fees for at least another five years in the case of the elder children, and for much longer periods for the younger ones. This means that the men in the Customs Service are in the ordinary course of things to be deprived of the only means of earning a living which they have learned at the very time when they need money most and owe most to their families.

Another form in which inducements are offered is the Chinese bonus. For six years a man who applies himself diligently to the study of colloquial Chinese can present himself annually for examination, and, if he passes, is recommended, and the recommendation recognized, he receives Tls. 75 after each successful annual effort. This is known as Bonus B. If he cares to present himself for Bonus A before the expiration of the six years he may do so, but in any event after having won Bonus B for six years successively he must present himself for Bonus A or drop out of the examinations. Bonus A is Tls. 150, and, to qualify, the candidate must have a knowledge of the written language, of Chinese documentary style, of Chinese Customs forms and documents, and a good knowledge of the spoken language. The candidate for Bonus B must employ a teacher and buy his own books, so that the Tls. 75 simply remunerates him for the money spent upon an instructor and textbooks. Bonus A is more truly a gratuity since the student is not required to employ a teacher. There is as much dissatisfaction expressed about these Chinese examinations as about any feature of the service, for it seems that the circular forms issued by the Inspectorate General are very differently interpreted by different examiners, so that while examinations are absurdly easy in one station and every one who comes with a Chinese book in his hand gets a bonus, in other stations really serious students are disqualified by unreasonably severe examinations and Chinese studies are abandoned.

Still another gratuity is the reward of ten per cent of the funds realized on the sale of smuggled goods seized by officers. In some ports tidewaiters and examiners are able to supplement their salaries by making seizures of smuggled and contraband goods, but as a rule the sums realized by the members of the staff are negligible. Informers receive thirty per cent of the proceeds of a sale of seized goods or of a fine inflicted upon smugglers, but the percentage to customs men is only ten per cent for seizures and they are not permitted to make any claim as informers. The Service never fails to realize less than sixty per cent on such sales. When dwelling upon the charms of the Service the Inspectorate never fails to lay stress upon the handsome windfalls that men may come by through seizures, but the men insist that the benefit is seldom considerable and is on the average very small indeed.

Two other phases of life in the Customs Service are frequently the subject of complaint. Those who are taken ill in the service pay for their own medicines and operations, while those who are incapacitated by illness contracted while on duty and who are forced to resign from the service on that account are not pensioned or permanently provided for in any way, but are given, at most, a year's pay and are dismissed to shift for themselves. Men on similar service in their home countries might not receive any more considerate treatment, but service in China is very different from service at home. The men are not only exposed to all kinds of weather in extremely hot and extremely cold stations as they might be at home, but they live in native communities and are exposed to diseases constantly.

In a Chinese community there is practically no quarantine and very little if any preventive sanitation. The north of China is fairly free from cholera and plague, which are common enough in southern ports, but in the north typhus, smallpox, and diphtheria are always epidemic, and in communities where there is no quarantine and no isolation the men who are constantly among crowds of Chinese workmen are always exposed to contagion. The insurance companies take this into account in China and so should an employer. Medical attention is provided by the Customs, but in the event of operations the employee must bear the expense, and in all cases he must pay for medicines. It is not difficult to obtain sick leave, or, when essential, to arrange for a transfer from an unhealthy locality, but those who are incapacitated for life by sickness contracted while on duty through no fault of their own have a right to expect particularly considerate treatment. Hours are too long, holidays are too infrequent and have to be sacrificed without compensation too frequently, as for instance when cargo is examined on Sunday, in which event the Service receives extra fees but the men who do the work none.

It is difficult for an outsider to suggest reforms, even though any number of sound suggestions have been made by men in the Service, but it should be very easy for men in the Inspectorate to judge the worth of such suggestions, the merits of each case, and to inaugurate reforms, if the members of the Inspectorate were interested. The outdoor men, who have voiced pretty unanimously at times the changes they require, have definite suggestions to make in some instances, and some of these are worth quoting as suggestions.

In the first place, they say, housing should be adequate and not only sanitary but placed in a sanitary neighborhood.

Medical attendance should include free operations and free drugs in all cases where accidents or sickness are due to climatic or Service conditions.

Working days should not exceed eight hours and there should be compensation for night work and work done on Sundays and holidays.

Transfers should be systematized, transfer allowances should cover freight charges, and employees should be given a month's notice of a contemplated transfer. Transfers should also be arranged so as to have an educational value, so that employees could gain an insight into the working of different ports and a knowledge of the cargoes peculiar to various ports.

Employees who are compelled to retire through sickness should be given compensation based in the first place upon the length of service, and in the second place upon the relative permanency of their incapacity.

Salaries should be very considerably increased and promotions should be made on a basis of professional ability.

Some definite system of retirement and of pensions must be arranged, even if it entails a loss of the existing gratuities and the withholding of a part of the employee's salary.

Nothing would give the outdoor staff of the Customs greater satisfaction and insure more faithful service than a guarantee of retirement on a competency after a certain definite period of service.

Japanese Copper Production

[BY KENZO IKEDA IN THE MINING AND SCIENTIFIC PRESS]

The Japanese copper output last year was about 90,000 avoirdupois tons, mainly produced in the form of electrolytic refined copper. The important smelting works and their contribution of metals are as follows:

Smelter and Company	Copper Production tons	Annual Capacity of Blast Furnace tons
Hitachi, Kuhara	17,000	400,000
Ashio, Furukawa	16,000	120,000
Besshi, Sumitomo	11,000	250,000
Kosaka, Fujita	10,000	400,000
Inujima, Fujita	4,000	100,000
Abeshiro	4,000	......
Ikuno	3,500	......
Osaruzawa	3,000	......
Ogoya	2,500	......
Others	10,000	......
	90,000	

•The amount of copper mentioned above is produced from copper deposits, which may be classified into the following four groups:

1. Fissure-filling deposits, or true veins, the majority being in Tertiary rocks and the mineralization caused by circulating solutions, represented by the Ashio mines. The largest known vein is 3,000 ft. long, averaging two feet wide, and is 3,000 ft. deep, occurring mainly in a liparite intrusive through Paleozoic slate, sandstone, and quartzite. The ores are composed of rich copper pyrite in a silicious gangue.

2. Pyritic bedded deposits in crystalline schists or Paleozoic rocks, such as the Besshi mines, the rocks being chloritic, graphitic, and Piedmontite schists. The deposits consist of pyrite and some magnetite, the copper content being 3.5%. The largest lode explored up to the present time is 500 ft. long, 4 ft. wide, and 3,000 ft. deep, the dip being nearly 49°. The form is nearly that of a sheet.

3. Complex sulphide deposits, or simple metasomatic replacements in Tertiary sedimentaries, but with no limestone beds, and in volcanic rocks, this class being represented by the Kosaka mines. The country rocks are liparite dikes and prophylitic andesite intrusives through liparite tuffs. The orebody is 1,600 ft. long, 400 ft. in maximum width, and 400 ft. deep, massive in form, with ores of three kinds, namely, pyritic or yellow ores, complex sulphides or black ores, and those with a quartz gangue, called silicious ores, the average mixture having 2% copper, 20% iron, 20% sulphur, not taking into account the sulphur contained in baryte, 22% SiO_2, 20% baryte, 6% zinc, and 1.3% lead, carrying some silver and gold. The mines are being worked by open-cut chiefly.

4. Metamorphosed metasomatic deposits, or so-called contact-deposits, in Archean, Paleozoic (mainly), Mesozoic beds, or older sedimentaries, and rather acidic plutonic rocks, as seen at the Kamaishi mines. The form and size are very irregular as compared with the other groups, and they are confined mainly to the margins between the Paleozoic clay-slates and limestones, and the intrusive granites and diorites. The copper deposit is associated with large adjacent accumulations of magnetite ore, so that the mine produces material that is treated for its iron as well as for copper.

These four classes of copper deposits are in different zones, each having characteristic features, so that usually it is possible to tell to what class a certain orebody in a district belongs and, moreover, a fair conclusion may be hazarded from previous study and experience as to what extent it may be possible to develop the mines. More than 90% of the total copper output, considered as to its origin, is distributed as follows:

From fissure-filling deposits	%50
„ bedded deposits	30
„ metasomatic deposits	14
„ contact-deposits	6

The remaining 10% of the copper production comes from miscellaneous ore deposits.

The methods of treatment followed are in outline as follows: Ores from fissure-filling and contact-deposits are subjected to concentration and are then smelted in blast furnaces by semi-pyritic smelting. The coke on the charge is from some 8 to 16%.

Ores from bedded, as well as from metasomatic deposits are usually smelted direct in blast furnaces by pyritic smelting. The coke consumed amounts to about 2 to 5%. The blast pressure employed is 1.5 lb. per sq. in. as a maximum, but generally is kept close to 1 lb. The ash-content in the coke is from 20 to 25%. The ores treated in these smelters are obtained chiefly from mines belonging to the same company.

I may cite another example of a pyritic smelter, namely, the Inujima, which was recently designed by myself. The smelter consists of one blast furnace 180 in. long for matting the ore, another furnace 110 in. long for matte concentration, and 14 Mabuki hearths for making blister copper. The smelter is for treating custom ores only, the charges being composed of a mixture of nearly 40 different kinds and sizes of ore. The blast pressure is about 0.8 lb. per sq. in., and the amount of blast supplied per minute is about 500 cu. ft. of free air for each foot in length of the hearth. No coke is used in the normal charge, but coal fed at the tuyéres as auxiliary fuel amounts to about 3%. The average copper-tenor is nearly 2.6%, the amount of fine in the charge being 35%. This is subjected to a preliminary stamp-briquetting, or to pot-roasting, according to the nature and degree of fineness. The Mabuki hearth may be called a Japanese copper converter. It is rather primitive, and is very simple in construction, but it requires some well-trained workmen. In addition to the furnaces in regular daily operation in this plant there is a spare 160-in. blast furnace and six extra Mabuki hearths.

Editorial Comment

President Feng and Economic Stagnation

If the Chinese are slow to appreciate the advantages of impressing their right of existence in the world upon other nations; if they are slow to put their backs into the development of their resources, the amelioration of their conditions of life, and the settlement of their internal affairs, they are not slow in the making of regulations and the issuance of promising looking Mandates. If the records of China could be turned out, a surprising mass of nicely phrased, well-meaning official reform proclamations, ostensibly intended to benefit the nation, could be found. And now we have another, which would seem to flatten out effectively and finally the charges of neglect of national interests that are constantly being made and which are in a sense repeated above. The President, as late as the twenty-first day of November in the year of grace 1917, issued a Mandate designed to encourage industries, though we think that the scheme is placing the financial cart before the administrative horse. The Mandate orders the Ministries of Finance and Agriculture and Commerce to coöperate in the formation of a central office for the purpose of establishing banks. In this President Feng Kuo-chang is, we believe, quite sincere, but so have been others who have put their substitute for the Vermilion Pencil, as well as that actual instrument, to somewhat similar documents of the kind. Yet previous proclamations have gone forth rich in wisdom and stored with good advice merely to fill the archives. No action has been taken upon them. That the fate of the others will influence the President to see that his Mandate will mean something will be the sincerest wish to all who have the slightest interest in China. The President entertains the highest hopes that his scheme will dispel the industrial and economic stagnancy and we hope that his hopes will be realized. They can be if some one with power and patriotism will first arise in China to organize an administration on effective modern lines, create a properly paid civil service, utilize expert foreign advice, and give trained and competent and honest Chinese executive power. The mere formation of banks will not do it. The following is the President's contribution to the mass of well-meant reform documents:

> With such extensive territory, vast produce and rich resources, as our country possesses, the principal reason why great agricultural, industrial, commercial, and mining enterprises are not energetically developed is the lack of special financial organizations. Other countries in the east and west have all given much attention to industrial encouragement and formed agricultural banks, which advance money on low interest for long terms, for the convenience and benefit of the agriculturists and workmen, and accept deposits and issue notes for circulation, thus facilitating the transaction of all kinds of business by the judicious handling of capital.
>
> In recent years, although regulations governing the Industrial-Encouragement and Agricultural-Development banks have been promulgated, scarcely any practical step has been taken, chiefly owing to the troublous times and financial difficulties that have assailed the nation, but also to our neglect to tackle the problem at the root. Unless special banks as indicated above are established, it is impossible to develop our resources and expand our enterprises.
>
> Let the Ministry of Finance and the Ministry of Agriculture and Commerce jointly devise means first to form the Central Office for the Encouragement of Industries, so as to set an example to the people. In all provincial capitals and important commercial ports, branch offices for the same should be speedily established, and in all districts, branches of the Bank of Agriculture and Industry should be established, as well as other organizations to develop agricultural enterprises, thus relieving the distress of our farmers and ameliorating the difficulties of our merchants. The superior officials in Peking and in the provinces should direct and instruct their subordinates to carry out this plan with diligence and energy so that our industrial and economic stagnancy may gradually disappear and the financial condition of our people may daily improve, when the foundation of our nation may be more than ever consolidated, for which I, the President, entertain the highest hope.

If China Comes Into Her Own

"*Thirty Thousand Miles in China*" was the title of a lecture recently delivered in Hongkong by Dr. K. C. Edmunds, President of the Canton Christian College, and Observer in Charge of the Magnetic Survey of China (Carnegie Institute of Washington). It is interesting to note that Dr. Edmunds, who has lived fourteen years in China, and who has traveled the great distance indicated by the title of his lecture, was not able to contribute one word on the subject of good road building. On the contrary all he could say about roads was that they were wretched and that they were China's great need. Of the things Chinese which he saw, the most important were the five sacred mountains; the five great engineering feats; the five Imperial burial grounds; the five kinds of highway; the five rivers of importance, and the railway system in China. The five great engineering feats were the Grand Canal, which he had traversed from end to end; the Hangchow bore; the Wall; the Salt Wells of Szechwan; and the Irrigation System of Kwanhsien, which gave such prosperity to the Chengtu plain. The tremendous possibilities for industrial expansion naturally vividly impressed itself upon him, and what he saw evoked the opinion that "China was destined to become one of the foremost producing nations of the world and a huge stabilizing, peaceful power if only it were allowed to develop its great wealth in its own way." This is a fact not to be denied. The Chinese are behind, of course, because of the lack of organized government. The timid among the wealthy will not invest their money in industrial enterprises at present because of the instability of administrative affairs, and the ordinary Chinese people who have a remarkable talent for comprehending mechanical contrivances are unable to develop that talent simply because they have not the education to enable them to do so, nor the wherewithal to supply the means. Everything therefore depends upon Government encouragement, and we have not the slightest doubt that when the politicians are done with their intrigues circumstances will force attention to the necessity for opening the country to trade and commerce and industrial enterprises. The fact that some Chinese are already pushing ahead in the face of difficulties is sufficient to indicate what will happen once they have freedom of action, and it behooves all who can, foreigners as well as Chinese, to coöperate in a campaign to force the politicians to have done with their selfish maneuvering while better men exert their efforts to benefit the country.

Constructive Effort for China

Mr. Julean Arnold, America's Commercial Attachè at Peking, who is particularly keen on a campaign of constructive effort being instituted, explained to a gathering of Americans at Shanghai recently, that what China suffered from was lack of incentive in the past to do things. In his opinion, what China looks for from foreigners is constructive understanding, the sort of understanding which will enable them to appreciate the reason for her apparent backwardness. She has managed to live so far by glorying in a glorious past history, and she was not in step when the change came in her existence a few years ago because her system of education was absolutely different from that of the west. Now that she is waking up, her history should be viewed in perspective, and no quick changes or hasty action should be expected.

Mr. Arnold must be given credit for practicing what he preaches. He recently managed to get a Society started in Peking pledged to constructive endeavor. The Society is to campaign chiefly for the betterment of Chinese commerce and industry. It is to study various questions by securing new information and utilizing statistics and facts already gathered by official organs, Chinese and foreign, and to bring these facts and information to the attention of both the Government and the merchants for the benefit of trade and commerce as well as for Chinese national welfare. The keynote of the society is that every member shall be an active member. The entire membership is to be divided into small groups for the discussion of certain subjects and to devise means to bring about the actual enforcement of the conclusion made. The society's activities shall have to do primarily with investigation, propaganda, and publicity work. The society recognizes the necessity of keeping within its limitations, aspiring to secure the maximum of results with the facilities at its command. To coördinate the labors of others and to coöperate with others in making for bigger results are among the methods to be used. Publicity and propaganda work through material published under the auspices of the society and through copy furnished by the native press will occupy a prominent place in the work of the society.

A Bad Advertiser

Speaking at the gathering devised by Mr. Arnold to form the Society for the Encouragement of Constructive Endeavor Dr. Paul S. Reinsch, the American Minister at Peking, expressed the opinion that China had many merits but that she certainly was the poorest advertiser. Dr. Reinsch, who has a very friendly feeling for the Chinese, put his finger on a national weakness. China is peculiarly slow to appreciate the activities of other nations in the field of publicity. She does not understand them. Her officials—or at least the old-style officials—see evidence continually of the advertising efforts of others, but they fail to realize what it all is. They can no more understand that advertising has made the beauties of Japan what they are in the understanding of the world than they can understand that character made the British Empire or the Republic of America. They imagine that advertising is just as useless as character, when the latter means true-blue patriotism; just as absurd as honesty when the latter means living solely on a salary while there are pickings about. And we do not mean advertising confined to newspapers or magazines, when we speak of advertising in connection with China. We mean, as does Dr. Reinsch, the many opportunities that annually arise to bring prominently forward the fact that China exists. Dr. Reinsch cited one instance of neglect. Three years ago, he said, he advised the Chinese Government to send three western educated Chinese to America to take up chairs in leading American universities on Chinese questions, and he promised that these nominees of the Chinese Government would be accepted by the American institutions. Such an offer would have been accepted by any other Government readily but so far he had yet to wait for an answer from the Chinese Government.

Taking advantage of this sort of thing has made Japan known to the general public of the world, in addition to her acute appreciation of the value of the newspaper. The majority of official Chinese neither understand University professorships, newspapers, magazines, commissions to foreign countries, nor the hundred and one other means at the disposal of any wide-awake peoples desirous of forwarding their own interests in the world. Japan understood it all, and because Japan understood, because she possessed some intelligence and some character, plus some ambition and the spirit to advance it, she is where she is, and China is where she is simply because she has not in any way developed the latent talents which she undoubtedly possesses.

A Plea for the Map Maker

Word has come to us that the Chinese Government is renaming many cities and already has issued postal circulars announcing changes in names. The why or wherefore of this calamity so terrible to those who have by dint of labor and midnight oil learned the location of some of the cities, has not been vouchsafed us, but if some kindly governmental hand would kindly stay the rod, not only the student but the business man and all who have to do with maps and names of places would rejoice.

The only plausible reason for changing the name of a place that we can see is that there are two of the same name so near together that they become confused. In the United States there are twenty-six cities and towns with the name Hamilton. There are one hundred and twelve with the name Cedar, either plain or with some qualifying word such as "Rapids," "Bluff," "Grove," or "Creek." Yet their mail does not go astray and there is no reason why China should not have eighteen Changsha's and as many Chung Hwa's, provided there are not two in any one province. If the English language, with its scores of thousands of words, sees fit to use the word "cedar" one hundred and twelve times, surely China can use the same character, "wong" for example, as many times if only another character is added to differentiate the several "wongs" from one another.

This disposes of the only seemingly valid reason for changing names that have served to identify the cities and towns of China these many decades. Other reasons may be advanced by the powers that be for altering the maps, and they must be weighty ones to compensate for the endless trouble that will be given the map maker and the business man who uses the maps. It is only recently that order began to come out of the chaos into which Chinese names had fallen by reason of the many variations in spelling due in some cases to the nationality of the map makers, some of whom preferred to use "tsch" for what others wrote "ch," but this was to be excused on grounds of linguistic preferences. A more pestiferous form of complication was that where two Sinologues of the same nation imposed two separate and distinct spellings on two parties of explorers each of whom followed a different method of Romanization in obedience to the aforesaid Sinologues. In one of the most valuable words on geology, it was found necessary to add a treatise on Romanization to explain and render partially intelligible the queer combinations of consonants employed. It would not be so bad if these consonantal inventions appeared at the end of words, but unfortunately they are always initial and it is not pleasant to have to paddle through the dictionary to find the word "su" and finally after searching under "Ssu" and "Szu" to discover what must be the word spelled "hsu."

The Japanese have changed several names of places in Chinese territory to conform with Japanese pronunciation of Chinese characters. Near Dairen is a town whose Chinese name is distinctly Sha-ho-kou. It means "shallow river mouth," and the characters that compose it are well known and form part of many Chinese names. Why then should it be renamed Sha-ka-ko because those able to make the change pronounce the word for "river" as "ka." They might as well try to change the name Honan to Konan, for the character is the same in each word. Much worse is the case of Tsingtao as spelled by the Germans. It means "green island," and English dictionaries spell the first word "ching." Now come the Japanese and change both words to make the Seitou. Let us hope that the foreigner generally will desist from further interference with existing nomenclature.

Therefore, we would most respectfully kowtow to the Government, and the Sinologue as well, and ask the one not to change any more names than absolutely necessary; and the other, that he abandon his theories of pronunciation so far as geographical names are concerned and follow the Chinese postal guide, which adopts a consistent method of Romanization.

This is the style of Romanization that has been used in the latest English maps and while the Sinologue may object, surely the simplification that its spellings show are all warranted and take less time to write, even though they may not bring out the full provincial pronunciation of the Chinese character. Anhwei for the foreign pen is quite an improvement over Nganhwei, even though the people of the province do give an initial nasal sound to it. At any rate the postal ~~guide~~ furnishes a cheap and convenient guide to the spelling of Chinese place names, and one which, if generally adopted, will serve to standardize Chinese maps.

The Question of Cheap Steel

According to the 1900 census of the United States, the average cost of pig iron was slightly more than $11 Gold a ton. The elements making up this cost were: Materials, 82 per cent; wages, 13 per cent, and miscellaneous charges, 5 per cent. Assuming that the Penchihu installation (described elsewhere in this issue) does not vary far from this average, which covers a production of more than 14 million tons, let us contrast the known elements of the United States blast furnace costs with those of Penchihu.

Ingredients for One Ton of Pig Iron

		U. S. Cost		Penchihu Cost	
Ore . .	1.9 Tons	@ G. $ 2.56—	G.$4.87	@ G. $ 1.20—	G.$2.18
Coke . .	1.25 ,,	,, 2.65—	3.30	,, 1.00—	1.25
Flux . .	0.52 ,,	,, 0.69—	0.36	,, 0.50—	0.26
Total Materials			G.$8.23		G.$3.69

So much for the materials, but what about the men? The average pay of a blast furnace workman in the United States was G. $470 a year, and the average tonnage per workman was 368 per annum, the average furnace being of 200 tons' daily output. As the furnaces at Penchihu have a total maximum output of 260 tons, or an annual capacity of 91,000 tons, the number of workmen, if they were of the same efficiency as those in the United States, and the smaller furnaces did not require more men in proportion to the tonnage than the larger ones of the United States, would number close to 250. Granting that they are only half as efficient as those in the United States, then the number needed would be 500. This is not terrifying, for the average wage is somewhat under one yen a day, and the yearly cost for each is less then Y.350 or G. $175. Granting that the Penchihu works needs double the number of men used in American installations, the wage cost for the 500 would be $85,000 Gold or 93 Gold cents a ton of finished iron as against G. $1.27 in the United States.

The salaried man also is much cheaper at Penchihu than in the United States where the averages worked out to require one man at G. $1,300 for each 8,000 tons of iron. This would mean 12 such men at Penchihu, and averaging their pay at Y.1,300 each, the cost would be Y.15,600 or Y.0.17 cents a ton. Miscellaneous expense in the United States is about 50 cents a ton and this includes selling charges and all expense other than that charged as materials, labor, and salaries. Allowing Penchihu the same amount for miscellaneous expense the total costs may be summed up as follows:

	United States	Penchihu
Materials above	G. $8.23	G. $3.69
Materials other	0.85*	0.85*
Labor	1.27	0.93
Salaried men	0.16	0.09
Miscellaneous	0.50	0.50
Total Cost	G. $11.00	G. $6.06

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*Not comparable, so each is allowed the same amount for materials other than ore, coke, and flux.

The above is considered to be fair to Penchihu in that while mining and other costs are placed at the average rate, twice the necessary amount of labor is allowed and the wage average is liberal. It must be remembered that the United States costs are those of 18 years ago and that labor has risen tremendously so that the cost of blast furnace work must be at least 25 per cent higher than it was then despite the many improvements that have come in since the above figures were taken. The pre-war freight on pig iron to the Pacific coast was about $3 Gold, and with the Panama Canal open, the China iron can be landed at Pittsburgh cheaper than the blast furnaces there can make it.

The same is true of steel, for the gas from the coke ovens at Penchihu could be used to turn the pig iron into steel while the leaner gas from the blast furnaces operated the coal mining and other machinery. Where labor enters more largely into the product, the situation of the Chinese rolling, stamping, and other steel working mill is even better and the disparity in costs is more marked than in the case of pig iron where materials make up so large a per cent of the total cost.

Such is the situation that confronts the Western steel and iron founder, and though many years will elapse before he can feel any effects from it,—if he feels it at all,—he might do worse than consider the advisability of joining in the vanguard of those developing China's industries and utilize the same cheap labor and materials that might otherwise in the years to come, compete against him in his own market. His investments in China could thus be used to supply his export trade while his home plants could take care of the local demand.

The Chinese Wireless Loan

Quite a pother was caused in diplomatic circles in Peking by the signature on November 25 of an agreement with a so-called Danish firm for a loan to erect wireless plants in China. The Minister of the Navy, Admiral Liu Kuang-sheng signed the agreement which called for a loan £513,627 from the Danish firm known to the Chinese as the Lung-sheng Company, represented by a Mr. Larsen who previously was connected with a German firm doing business in China. The agreement provided that the stations to be erected would be used for naval and military purposes by the Chinese Government and also for communication with foreign wireless companies, the stations to be under the control of the Danish Company who would pay ten per cent of the annual receipts to the Chinese Government.

The fact that Mr. Larsen was previously in the employ of a German firm, that the Minister of the Navy is pro-German in his views, that he signed the contract without consultation with any of his Cabinet colleagues, that the German Telefunken Company was alleged to be connected with the deal, that China is supposed to be at war with Germany, and that anyway China had no call at this time to borrow money for the purpose described, roused the suspicions of the Allied Ministers and they promptly moved to have the Government disavow the arrangement. The Chinese Government saw the reasonableness of the contentions put forward by the Allies and instructed the enterprising Minister to cancel the agreement, which he did.

The incident merely affords one more piece of definite evidence of the activities of German firms in China. Despite the fact that they are cut off from home supplies they are ever laying plans for the future, and are endeavoring by all possible means to make contracts with friendly disposed Chinese for after-the-war business. Allied manufacturers and commercial men would do well to counter this move by doing likewise.

China and the War

In an address on "China's Opportunity in the War" before the American Manufacturers' Export Association in New York, Mr. M. A. Oudin, who recently visited the East, said quite a good word for China. The outstanding feature of the address is the demonstration that Mr. Oudin is a keen political observer and kept his eyes open. Unlike some other travelers in limited radii, who make pretentions to talk with authority of whole hemispheres they have not seen, he has not allowed his views to be colored by spectacles intentionally provided by interested parties. He exhibits that broad sympathy which manifests itself in all who wish to see the weaker peoples rise out of their misery, their dependence, and their stagnation, and build for themselves a substantial national footing which will enable them to deal with the rest of the world, as he puts it, "on a basis of equality." He is not one of those who advocate that China should be placed in leading strings. What he wants is that China be given a chance.

Mr. Oudin's address has been so widely published elsewhere that it is unnecessary for us to reproduce it here. He sees that the war has given China the most promising opportunity to free herself from the shadow of foreign domination that has arisen since the first shock resulting from political contact with European countries, and he urges that at the Peace Conference the Allied Powers accord her full recognition of her sovereignty. He asks, Will these countries voluntarily surrender special privileges and claims for special position in China, and otherwise recognize her just demand? And we might reply that now that America and Japan have jointly agreed to take steps to prevent the impairment of China's sovereignty, and since Japan has agreed to consider her "special interests" as merely those developed by geographical propinquity, there is every reason to believe that the nations will revise their ideas about China, when the time comes, providing that China herself demeans herself so that she will warrant their confidence.

Everything depends upon China now. Until Japan signed the agreement with America early in November reaffirming previous undertakings with regard to China's sovereignty, equality of opportunity in China, preservation of the open door in trade and commerce, and entered into an additional undertaking that no nation should have exclusive rights in China, there were many who suspected the policy of Japan. That suspicion should now be removed by Japan's confirmation of the policy of the present Government as announced by the Premier, Count Terauchi, when he took up office, viz., that Japan's policy henceforth would be one of friendliness to China.

That is all that China wants, and all that other nationals interested in China want. Now that Japan has set about removing the suspicion, no matter what the basis of that suspicion might have been, that she will employ political gains in China to discriminate against others, that she will employ commercial concessions to build up political rights, and that she will take advantage of the occupation of others, or the internal political troubles of China, to enhance her own political standing in China, there should be a cessation of hostility towards her both on the part of loyal Chinese and interested foreigners. Japan has taken a definite and irrevocable step in conjunction with America which should remove all doubts as to her future attitude, and we join with other journals throughout the world in asking that the respect which the new undertaking merits be accorded it. Japan is entitled to all the confidence that can be reposed in her while the new pact is adhered to, and we have reason to believe that the predatory politics in which the late Ministry in Japan indulged to the detriment of Japanese interests in China will not be repeated. The world has the definite pronouncements of the present Premier for that, apart from the new agreement signed with America. And that being so, China's chief bogey—or what has been China's chief bogey—should be removed, and being removed, then it should be the pleasure as well as the duty of the Allied Powers to see to it that China secures the fair play to which she as a nation is entitled, what time China should herself demonstrate that she is worthy of that consideration and is capable of founding a properly organized government. The internal strife now proceeding in China is sufficient to discourage her well-wishers, but it is a natural part of the evolution which China must go through in her transition from the oldest autocracy to the newest form of Republicanism. Bad as it is for commerce, indefensible as it is from a national point of view, one thing must be admitted, and that is, that it might be worse.

As Mr. Oudin points out, however, it is in consequence of these factional disputes, which seriously interfere with the development of the country, that certain people have suggested that China for a number of years should be taken in hand by the Powers and subjected to some form of foreign leadership. He does not believe such a thing to be realizable, and further aligns himself with those friends of China who believe that a people whose patience, untiring industry, physical stamina, intellectual strength, self-control, and courtesy have long been recognized the world over will evolve a government that will insure prosperity and happiness. Those who know the Chinese, says Mr. Oudin, will ask for them only time and a sympathetic, not a patronizing attitude, on the part of foreigners. Given assistance, not that derived from the concerted political action of the Powers, but financial, technical, and educational assistance, and, with forbearance on the part of all the nations, China should reëstablish herself in time as one of the great nations of the world.

In his address Mr. Oudin made a strong and manly appeal to the United States to see that China had fair play, and in this respect China knows that she will get from America the broadest and most friendly consideration as she will from other countries. But to deserve it China should act promptly on the friendly advice tendered to her by President Wilson in June last, when he urged that factional political disputes be immediately set aside and that all parties and persons work for the reëstablishment of a coördinate government and the assumption of that place among the Powers of the world to which China is so justly entitled, but the full attainment of which is impossible in the midst of internal discord. China is not, however, justified in floundering in chaos because it happens to be excusable as part of a natural process of national evolution. She owes it to herself at this period to show that she can be above civil strife and that she can organize a government on the basis for which the nations with which she is allied are fighting the present terrible war.

The Golden Dilemma of Japan

Prohibition of the export of gold from Japan has put some of the industries of that country into what the war correspondents might call the jaws of a pair of pincers, or on the horns of a dilemma, or cast them between those classic nippers, Scylla and Charybdis. As those industries contribute largely to the welfare of Japan and have helped swell her credit balance through export of manufactured goods, they are now holding up their hands to the government and saying—"What will you do about it?"

Theoretically the finance department's argument that as Japan is exporting more than she is importing, there is no need to export gold and that all which comes in shall stay in to give the country a firm balance so far as the actual metal of exchange is concerned, is right. But financiers have overlooked one fact or series of their reading of the trade returns and the balance resulting therefrom. Japan does not do her heaviest buying in the country where most of her goods are sold, and while the balance may be largely in her favor when the total is considered, or when trade with China and the United States, the two heaviest purchasers, is taken into account, the case is slightly different when a balance is to be struck in the trade with India.

Japan's trade with the world to the end of September shows a net income of four hundred million yen. The excess of exports to China was one hundred and sixty millions and to America one hundred millions. But in the same period, exports to India were only sixty-eight million yen as against purchases of more than one hundred and fifty millions. When the export ban was put on gold, an immediate outcry was raised by the cotton spinners who dependon India for a large portion of their raw material. The government told them that they had better buy their cotton in the United States where Japan already had a fine trade balance against which the cotton importers could draw, or in China where there also was much cotton and an even larger trade balance.

This solution looked easy to the government, but not to the cotton spinners. Their counter argument was not long in coming, and they pointed out how much better it would be if some financiers would study the industries and get at a few basic facts. They quickly demonstrated that cotton spinning machinery made to work up a certain grade of fiber, in this case a mixture of Chinese, Indian, and American, could not shift to some other mixture without a serious dislocation not only of the purse strings, but of the labor element as well. Then the Seiyuaki, the government's own political party, took up the cudgels for the spinners with the result that thirty millions of gold was allotted for the purchase of Indian cotton.

This was some immediate relief, but not enough for the spinners, who pointed out their need of nearly three times that much money to carry them through the year, and urged the government to let out at least forty millions more and perhaps another forty millions on top of that. Eighty millions seemed a rather large sum to the government officials who had the conservation of gold in charge, and they began to study some statistics of India's cotton goods trade. The solution was too easy, they joyfully advised the cotton men: All that was necessary was for the cotton spinners and weavers to sell the people of India eighty million yen worth of cotton goods. This certainly was the proper solution, they argued, since it would enable the cotton men to get themselves by their own unaided efforts out of the pit into which they had fallen through their inordinate desire for Indian cotton.

But queerly enough, this solution did not appeal nearly so strongly to the manufacturers as it did to the financial students of the government bureaus concerned. How are we, the cotton men ask, to compete with India cotton, woven in India, with labor as cheap as our own, under managements that have studied the exact requirements of the Indian consumer? Even though we could do this, what is to balance the heavy freight charge from India to Japan on raw cotton and the still higher freights on the manufactured cloth. Give us another answer.

To date, the government has entered no brief in rebuttal, but from the trend of opinion, as expressed in the Japanese financial press, the government will have to abandon its position in part at least and loosen the purse strings to the extent of another forty million yen at least. At any rate, say the manufacturers, we shall have injected a little practical economics into the theoretical vacuum and perhaps have taught the government that no matter what else it overlooks, it must always consider cotton.

Chinese Politics

Chinese politics, as politics are generally understood, have ceased to exist. The events of the latter half of November are still inexplicable, or rather are explained by so many contrary theories that no foreigner and few Chinese are convinced that they can give an adequate explanation. President Feng Kuo-chang, leader of the so-called Chihli faction of the Peiyang party, and Premier Tuan Chi-jui, leader of what is know as the Anhui military faction, did not cordially agree on the policy to be adopted for the removal of the opposition to Government policies strenuously maintained by Sun Yat-sen's military government at Canton, Lu Yung-ting's passive but effective obstructionism in Kuangsi, and Tang Chi-yao's military government in Yunnan. To these problems was added a revolt in southern Hunan, which very apparently had the support of Lu Yung-ting, though he would not admit it. South of the Yangtze the Government had a military hold upon Fukien, Chekiang, and Hunan; Szechwan was at war with Tang Chi-yao on its own account, and in the central provinces of Kiangsu, Hupeh, and Kiangsi, the President's military following held absolute sway. Therefore Premier Tuan decided, after many futile efforts to compromise, that he was in a position to suppress all the various rebellions by force if he had the President's concurrence and this was reluctantly given, although the actual military support of the President's military following was never forthcoming. The campaign in Hunan was therefore undertaken by northern soldiery under the direction of Tuchun Fu Liang-tso and, in spite of the "neutral" attitude of Hupeh, Kiangsu, and Kiangsi, it appeared for a time that general Tuan's policy would succeed.

There were other features of the situation, however, which militated against the Tuan Government in Peking. To obtain money and arms for the campaigns, or nominally to that end, certain members of the Tuan Cabinet entered into negotiations with the Japanese for loans, sales of arms, and the like, which, when given publicity, aroused a storm of adverse comment and brought forth protests from the Yangtze Valley Tuchuns. These protests, not being very effective, were followed by overtures of mediation between the North and the South, and as the second telegram of this character was signed by the commander of the northern forces fighting in Hunan, General Wang Ju-hsien, Premier Tuan felt that he had lost his grip upon the situation and resigned. It transpired at once that in Peking General Wang Shih-chen, Chief of the General Staff, and General Li Chang-tai, commanding the gendarmerie of the Metropolitan District had had something to do with the dispatch of the "peace telegram," whether because they wanted peace, or because they wanted to rid the Tuan Cabinet of certain objectionable members, it is hard to determine.

The Premier resigned on November 15. The following day, at a conference with the President, he consented to resume office on condition that his policy be supported, so the President dispatched telegrams reprimanding his Yangtze Valley following for their pacifist attitude, and the Cabinet was reinstated. Then came the news of Fu Liang-tso's flight from Hunan, Wang Juh-sien's defeat and flight, and the general collapse of the northern army in Hunan; and the Premier again resigned and insisted upon having his resignation accepted. His resignation was followed by that of all Cabinet members except Tsao Ju-lin, Minister of Communications, and Liu Kuan-hsiung, Minister of the Navy.

For the next two weeks there was no Government worthy of the name functioning in the Capital, and the various southern forces, encouraged by the collapse of the Tuan organization, began to take fresh courage and to organize attacks upon Fukien, Szechwan, Hunan, and Hupeh, while minor revolts sprang up in many quarters, independent of any well defined movement for the most part; and notorious bandit leaders set up "military governments."

No one would accept the responsibility of forming a Cabinet. Wang Shih-chen, Hsu Shih-ch'ang, Hsiung Hsi-ling, Lu Tseng-hsiang and many others were approached but all declined. Wang Ta-hsieh, Minister of Foreign Affairs in the Tuan Cabinet, who was in the French Hospital on sick leave, was prevailed upon to accept the title of Acting Premier, but he refused to function in any way and commenced sending in resignations to the President almost as soon as the office had been conferred upon him.

On November 21 Wang Shih-chen consented to act as Minister of War and promptly moved his office into the Presidential Palace to give all concerned to understand that he accepted no responsibility but was at the President's orders. President Feng and his Yangtze following failed to agree on many things, Tuan's following stood aloof, no one had any real power, and in the meanwhile the campaign in the south was going from bad to worse, Hupeh and Kiangsi were threatened by the Hunan and Kuangsi troops and the Tuchun of Hupeh, Wang Tsan-yuan, began to call for reinforcements or for a cessation of hostilities.

In Canton an organization was effected for a campaign against Fukien, under the leadership of Chen Ping-kun and the

Tuchunship of Mo Jung-hsien, and the runaway ships of the navy, under Cheng Pi-kaung, were financed by the Kuangtung provincial treasury.

In Szechwan the loyalists did well and drove the Yunnanese invaders out of Luhsien and Suifu. In the last days of November, however, the Kueichowites threatened Chungking, the most important port in Szechwan, there was an independent rising at Ningpo, in Chekiang, against Yang Shan-teh, and the northern commanders in Hunan, with a passion for compromise, threatened to make peace with the enemy if reinforcements were not sent to Yochow on the Yangtze. At last, on the 30th, Wang Shih-chen, who had been a prime mover in the campaign for peace, accepted the acting premiership and it was announced that the 11th Division of the Peiyang Army was being sent to Yochow to hold this important point pending a settlement with the South. Premier Tuan's resignation was finally accepted, together with the resignations of all other Cabinet members except Tsao Ju-lin and Admiral Liu Kuan-hsiung. At the same time it became apparent for the first time that the northern Tuchuns, Military Governors of about eight provinces and three administrative areas, were getting in touch and starting a movement to oppose the peace movement favored by Wang Shih-chen, and advocated by the Yangtze Valley Tuchuns.

New Cabinet appointments were announced on December 1. The personnel of the new Government was as follows: Premier and Minister of War, Wang Shih-chen; Minister of the Interior, Ch'ien Neng-Hsun; Minister of Foreign Affairs, Lu Tseng-hsiang; Minister of Finance, Wang Ko-ming; Minister of Justice, Chiang Jung; Minister of the Navy, Liu Kuan-hsiung; Minister of Agriculture and Commerce, Tien Wen-lieh: Minister of Communications, Tsao Ju-lin. At the same time General Yin Chang was appointed Chief of the General Staff to succeed Wang Shih-chen. This list of appointments was no sooner announced than it was greeted with much scathing comment, but it had been most difficult to get any one to serve in any office and it was generally felt that the Cabinet, whatever its character, would not last long anyway and might as well be tolerated just to keep up a Government of some sort in the Capital.

More adverse reports began to come from the South. It was learned that a conference at Wuchow in Kuangtung had resulted in a campaign compromise among some of the Southern leaders. In Hupeh two commanders of local garrisons, one at Chingchow and one at Hsiangyang, announced their independence, and in Peking Tsao Ju-lin insisted upon leaving the Cabinet, and retired to the hot springs at Tangshan for two weeks on a plea of illness.

President Feng insisted that he had a "responsible Cabinet," while Wang Shih-chen, the head of that Cabinet, insisted that he had not and that all responsibility was on the President's own shoulders. By the fifth of the month the Tuchuns had effected a meeting at Tientsin and had decided that they wanted war with the South and no compromise. They insisted that if their troops were not sent by Peking, they would take them themselves and they elected two commanders, Tsao Kun for a campaign in Hunan, and Chang Huai-chih of Shantung, for an advance upon Kuangtung through Kiangsi.

At the same time Governor Yang of Chekiang reported that he had suppressed the rebellion at Ningpo, and the Yangtze Tuchuns showed some signs of favoring war again as their borders were approached by the victorious southern forces. The first Cabinet meeting was held on December 8 and the tendency seemed to be to favor war, although immediately after the meeting Premier Wang Shih-chen stated positively that he had taken the post to negotiate peace and that if there was to be no peace he would resign.

A few days later there came a report of an offensive alliance between all the southern leaders and it was announced that Li Lieh-chun, once Governor of Kiangsi, and one of the promoters of the revolution of 1913, was advancing upon Swatow and the Fukien border with two Yunnanese Divisions. On the twelfth, therefore, as there seemed no hope for peace, Premier Wang approached ex-Premier Tuan and asked him to take back his office. Tuan Chi-jui refused, saying that he was having a very quiet, pleasant time practicing Chinese caligraphy, and two days later when he was summoned to the Presidential palace he again refused flatly.

Tuchun Li Shun, one of the authors of the peace movement and one of the "neutral" Tuchuns before the fall of Tuan Cabinet, was in the meanwhile suspected of having held up reinforcements which were intended for Fukien and Swatow, and it was believed that he would resist the passage through Nanking of the troops of Tsao Kun, Ni Shih-chung, and Chang Huai-chih, when they commenced their independent campaign against the south. The hostility against him therefore became intense and on the fourteenth it was reported that General Ni's troops were advancing to make an attack upon Nanking while Li Shun was preparing to meet them. At the same time came the news of the fall of Swatow, the last strong Peiyang outpost in Kwangtung.

The terrible confusion and disintegration seems to be increasing with every day's reports. The President says the Cabinet is responsible, and the Cabinet says it is simply working for the President and assumes no responsibility. The National Council, assembled to draft new parliamentary laws, still exists but evidently considers itself moribund since it is largely a Chinputang organ and since all Chinputang men have withdrawn from the Cabinet.

In the South, Sun Wen will have nothing to do with Cheng Pi-kuang because he is now supported by Lu Yung-ting. Lu Yung-ting, who is directing the campaign in Hunan, says he is directing nothing because he is ill and has no time or thought for public events. Tan Hao-min, his right hand man and one of the invaders of Hunan, disclaims affiliation with all rebel movements but says he will accept the Governorship of Hunan from the rebels if Peking will confirm the appointment. And so it goes in every quarter of the country and in every little clique. No one can see how the wind is blowing and no one cares to risk an opinion.

Opening of Northern Korea

Reports from Korea state that the Seishin Kainei Line was completed for traffic the latter part of November, which adds another stage of progress to the transportation system in northern Chosen, and will aid the exploitation of the resources there. Of the more important industries, those which have the brightest future are iron ore, coal, and lumber. The lately discovered iron mine in Mosan, is said to have a vein three miles long with over five strata and covering a wide field. The total amount of ore available is calculated at 200,000,000 tons, the larger part of which is under the ownership of the Mitsubishi Company. The environment of Mosan is topographically rough, so that it hindered the development of traffic, and unless a large outlay of capital was to be made, ore was not obtainable. With the opening of the above railway, however, the mines in those parts, which did not call attention on account of inaccessibility, although known, have now come to be competed for. The other firms who have petitioned for license, besides the Mitsubishi Company, were the Kuhara and the Suzuki houses.

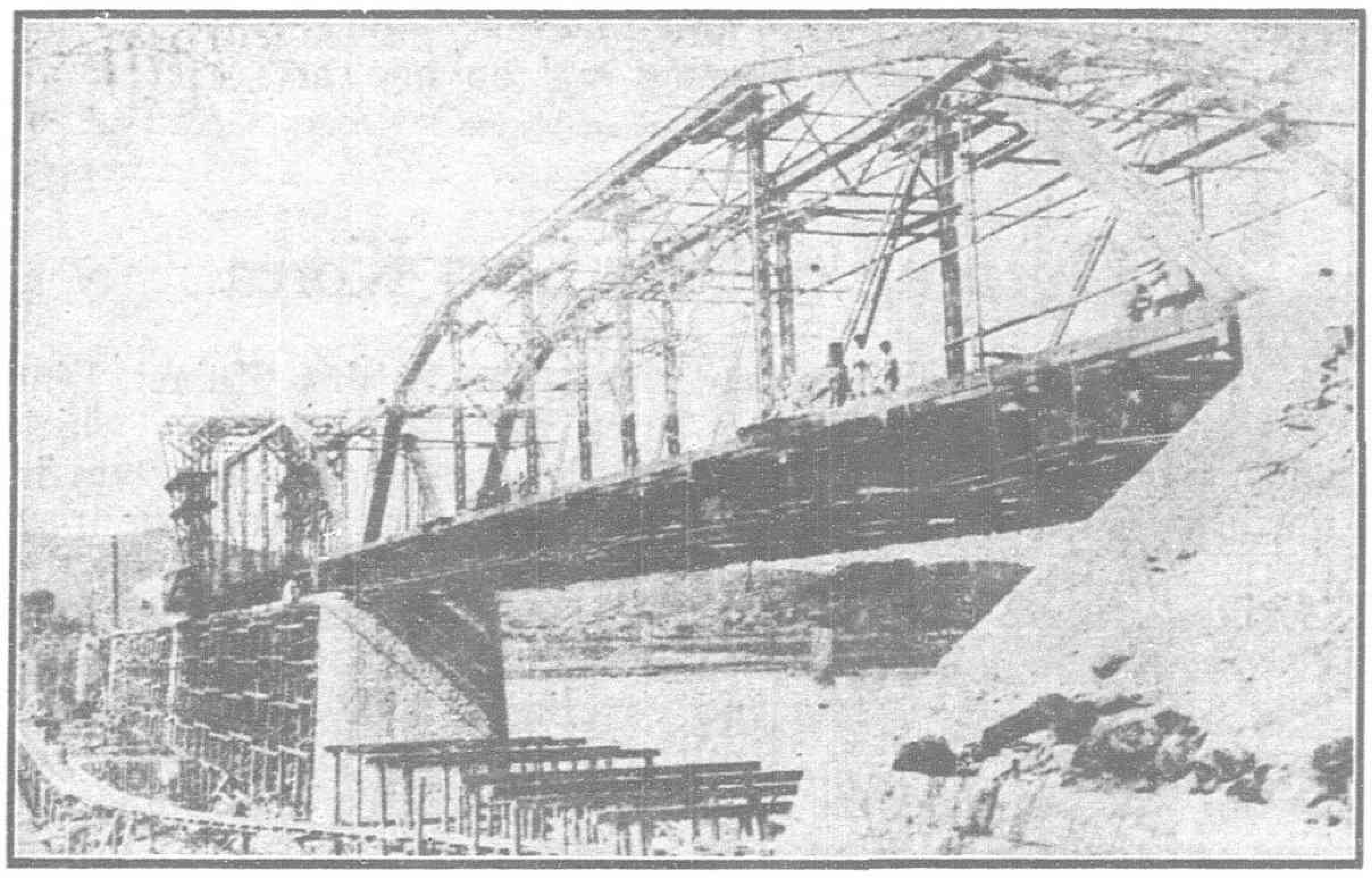
The province of Kanhoku is covered by a vast coal field capable of giving a large supply, but the drawback up to recent times was the inferiority of the product, when compared with the Anshu coal. Hence, outside of a small area, no one attempted to undertake the mining thereof. With the rise of coal prices, however, the natives in northern Chosen have come to mine it, for they can obtain eight yen a ton in Kainei and ten yen in Seishin, which is far cheaper than using the Japanese output. Although it does not possess the heating power of other coals, it is suitable for homes. According to the view of experts, a large scale undertaking could be established.

The forests on the banks of the river Tumen cover a vast area, and the Government-General has taken advantage of the resources by establishing a sawmill in Kainei, so that the output has been greatly increased. Lately, in order to take advantage of the forests on the banks of the Yalu, a pulp manufacturing plant has been built in Shingishu. It is reported that a paper manufacturing mill was to be established in some locality in this region. The Suzuki firm of Osaka has already commissioned experts to investigate the forests near the Tumen in order to see if a large lumber mill would pay.

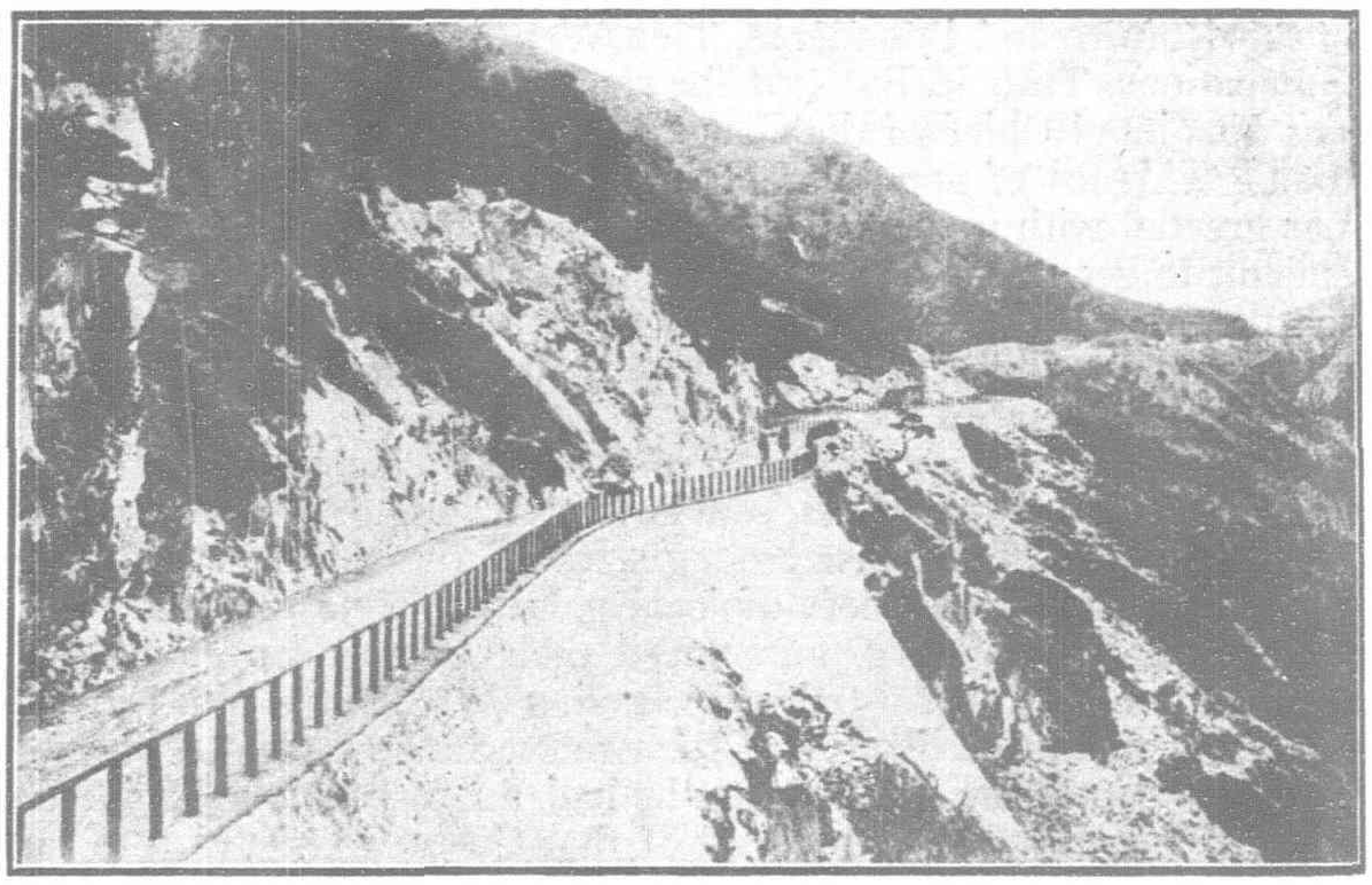
Good Roads in Korea—Bad Roads in China

The Chinese may well take a lesson from Japan in the matter of road construction. In Japan there is continual development in this direction, but it is to Korea, which at one time was virtually under the ægis of China, that particular attention has to be directed. Korea, like China, never deemed a road worthy of a second thought, but no sooner did the Japanese secure the right to administer the country than roads began to appear. A definite road program was arranged, and while the Government undertook to build roads in six years at a cost of Y. 10,000,000, the local Governments were also encouraged to adopt definite measures for road construction. The Government's plan had to be modified somewhat but with the roads constructed prior to annexation, aggregating 208 ri (a ri equals 2.440 miles) some 641 ri had been built by the end of the 1914 fiscal year at a cost of Y. 6,619,310, while by the end of the 1915 fiscal year the total length of roads constructed by the Government-General reached 761 ri, the cost being Y. 7,714,693.

Local Governments are required to assist in the construction of State roads as well as to carry out local work, the work being paid for not only with money from the Local Expenses Funds, but with subsidies from the Central Government. Labor had also to be contributed. Thus roads constructed by Provincial Governments, with the aid of subsidies since the annexation, up to 1915 aggregated 428 ri, while those constructed by Local Expenses Funds and contributed labor reached 989 ri.



Kanko Iron Bridge in Course of Construction



New Road Construction, Kwaizan District, North Chusei Province

The roads built are all substantial and capable of carrying motor car traffic. On many of the roads motor services have been instituted to carry passengers, and they are profitable. The country generally has been benefited and the people in particular have learned to appreciate what a well maintained thoroughfare means.

The illustrations herewith are sufficient in themselves to indicate how the Koreans are being served, and in contrast it must be mentioned that the Chinese Government has so far done nothing to construct even one road.

The Metropolitan Union Flood Relief Council, formed to assist the sufferers from the great flood near Tientsin, have recently started the refugees on road building work, the idea being to connect Peking and Tientsin by road. It has to be mentioned, however, that this Committee is directed by foreigners, and that it was the American Red Cross which started the ball rolling by offering to meet half the expenses.

It is nearly time that the Central Government laid down a definite plan for road building, and it should begin by regulating the width of cart tires. All carts in China have tires which seem to be designed for road destruction. They are sometimes but one inch wide, and many are cogged like an ordinary cogwheel of a machine. The wheels have been made narrow, it is said, to enable the cart to carve its way out of the eternal bogs, while the cogs are used to create a friendly and companionable rattle on the old stone roads. The Chinese like noise, which was discovered to the cost of an American who introduced barrows which would not squeak. Every barrow used in the country charms its pusher by the hilarious squeaking which movement of it creates, and he would be very lonely without it.

A vivid little picture of just what bad roads do to kill China's trade is given by the Kiangchow (Shansi) correspondent of the *North-China Daily News*, under date of December 5. He writes:

"Shansi is at its best in these days. The weather is magnificent, and the carting season is now in full swing. It seems incredible that a province so full of commercial possibilities should continue to be hampered as it is in the matter of transport. There is no traffic in June and July, as the harvesting operations call for all the animals. In August and September and far into October floods render roads impassable and rivers uncrossable and only now does merchandise begin to move with some hope of constancy unless hindered by snow, until spring rains again dislocate the traffic.

"If only the roads were kept in some sort of order the Shansi cart as a vehicle is not to be despised. Long strings of carts drawn by four mules each are struggling through the gullies, each hauling 2,000 catties of goods to or from the railway and to every traveler these teams and teamsters are a constant marvel.

"The hills they manipulate, the streams they cross, the way they collide or pass in the gullies are each in their way unique, and under the present circumstances Shansi to a visitor would appear a very hive of commercial industry.

"But there is the other side. Goods coming along now are six months' overdue! Some have been lying in inns or farmers' houses for weeks while the carter, forgetful of his contract, has been sowing, reaping, and storing his autumn crops.

"Then the cotton bales are diminishing in bulk as they pass from stage to stage, though maintaining their weights, through the ingenious methods the inn men have of providing themselves with wadded garments for the winter. Then, too, freights are heavy for all the summer, excessive claims have been enforced by the military transport officials, and the carters have suffered, while a feature of recent years is the large number of offices along the roads where traffic is mulcted sums of money for nobody seems to know what. Here is a transit duty office; there a destination tax office and anon a merchandise tax, with many a mule master's ancient custom thrown in, to say nothing of gate money and ferry tolls, as well as likin. Enough money one would imagine is levied to keep roads in repair and yet nothing is done."

Anglo-American Unity

Britons and Americans in China Get Together

In emulation of the coöperative spirit that is entering into all relations between the Occidental nations which have united to make war upon the evil genius of Prussianism, there has been a very marked effort on the part of the English-speaking people in China to come to a closer understanding during the past month, and the first experimental steps leading to Anglo-American coöperation in China have aroused some very real enthusiasm, especially in Peking and Shanghai. China is a long way from the centers of inspiration now, communications are not as good as they were before the war, and Occidentals in the East imbibe some of the Oriental spirit of apathy and procrastination, so that it takes a long while for a movement originating in the West to take a hold in the East and vitally affect the conduct of foreign affairs in China. Anglo-American coöperation has had its ardent prophets and apostles in China for many years, but their doctrines have been received with either indifference or suspicion, and their voices have seldom penetrated to the inner chambers of the directors of American or of British affairs in the Orient.

It has always been recognized that Americans and Britons, both insular and colonial, had much more in common than a common language. It was recognized that the inherited Anglo-Saxon spirit was the common property of all the peoples of Anglo-Saxon descent and that it had been infused to a remarkable degree into all the non-Anglo-Saxon peoples who have come under the British or American flags, giving them business standards, common political standards, and common social and moral standards. It was also recognized that this common spiritual heritage differed somewhat from the spirit that inspired all other peoples with whom the English-speaking Americans and British came in contact. Yet it was never thought worth while, nor was it quite good form, to emphasize this community of interests at a time when cosmopolitan tastes and affiliations were considered essentials to good form in the Orient. It would have been considered a sign of narrow racial egotism before the war for an American to have said he liked either the Americans or the British better than the Germans, so he would have been much more likely to claim that he preferred the society and the methods of Germans just to prove that his tastes and affiliations were catholic. It takes time to live down old traditions in the conservative European communities in the East, and it has taken a long while to get the Americans and the British to say that they have a great deal in common, that they like to work together because they can work comfortably together, and that they would appreciate closer understanding leading to effective coöperation. The many and lengthy reports of the growing spiritual entente between America and Great Britain in the Occident, detailed with sincere enthusiasm by the political and intellectual leaders of both peoples, have finally driven the communities in the East to introspection and the result has been a series of experimental foregatherings in both Shanghai and Peking, which have undoubtedly given both Americans and Britishers a taste for more.

The manifestations of this growing "get-together" spirit have come in rapid succession. They came in the following order. On Thanksgiving day the American community in Shanghai issued invitations to the British and Allied consular officials to participate in the Thanksgiving service. This was accepted as an overture of friendship, by the British especially, and there was immediately talk of reciprocation. Then, on December 3, in the *North China Daily News* there appeared a very eloquent letter over the signature "Spectator," in which China's pitiful disintegration was forcefully described and in which an appeal was made for Anglo-American coöperation in the readjustment of China's affairs. "Unity and coöperation, between American and British subjects in China," wrote the correspondent, "is essential now. They must, they must work in harmony. Now is not the time to strive in petty rivalry for aggrandizement at each other's expense. It is imperative for them to unite and to frame a policy which shall preserve to the last the possibility for this country to work out its own salvation, and having framed the policy to press it upon their Governments and to see that it is carried out in Peking. Publicity is what is wanted. The formation of an Anglo-American politicial union in Shanghai and the other Treaty Ports would enable a beginning to be made. There is no need for secrecy or so called diplomacy. The more outspoken we are the better."

Four days later this elicited from the *North China Daily News,* which is the organ of the most conservative British element in the East, ardent editorial approval, and it was editorially suggested that the British and the American Minister in Peking should unite forces to assist China in the solution of her difficulties. One has to have breathed the fog of suspicion and prejudice that has been drawn over international commercial intercourse in Shanghai and diplomatic intercourse in Peking in the past, to understand how radical and revolutionary a suggestion this was.

In Peking, on the December 8, a meeting of the returned Chinese students, educated in America and Great Britain, was held in Peking as an "Anglo-American-Chinese Reunion." The British Minister, Sir John Jordan, the American Minister, Dr. Paul S. Reinsch, and the Chinese Minister of Foreign Affairs, Mr. Lu Tseng-hsiang, were among the speakers and a great deal of genuine cordiality and good feeling were manifest.

Three days later, on December 11, the Committees of the American Association and of the American Chamber of Commerce were entertained at dinner in Shanghai by the Committee of the British Chamber of Commerce, and on the same night the first of two Anglo-American Patriotic Meetings was held in the Y.M.C.A. in Peking, with the American Minister presiding. The following night the British Minister presided at a similar meeting. Apart from the Ministers, the speakers on these occasions were Dr. Arthur Smith, a well-known writer upon Chinese life and manners; the Rev. E. J. Bentley, chaplain of the British Legation; the Rev. C. S. Ogilvie; and the Rev. R. K. Evans. More than four hundred Americans and Britishers from the small Peking community attended these two meetings, and while the discussion was largely of war, this being a common topic of interest, the essential feature of the gatherings was the recognition of the American and British community of interest, not only in Europe and in the prosecution of the war, but in China also and in the routine of commerce and diplomacy.

Satisfactory as all this is to the sentimentalist, it is far more satisfactory to the practical business man who looks forward to keen commercial enterprise in China after the war and who knows how to appreciate commercial allies, and it is still more pleasing to the wholly unsentimental and practical Chinese to find the two nations which they most trust and upon which they most rely for help and protection, promising to work together, and to work together for China as well as for themselves. It is felt by the commercial communities that wherever Americans and Britishers can be brought to pool their commercial interests, a standard of clean, straightforward business methods will be established, German methods will be impossible, investments will be sound and secure, and expansion will be rapid but will not be to the cost of the Chinese. The latter point the Chinese thoroughly understand and appreciate. And just as British and American business methods contrast with German business methods, so do American and British diplomacy contrast with German diplomacy, so that an Anglo-American diplomatic understanding brings an assurance to the Chinese that they will be amply protected from imposition and aggression and that their development, which comes to be increasingly difficult and painful, will be encouraged and not retarded from the time that America and Great Britain announce that they have identical diplomatic and political interests in the Orient. It is impossible to suggest any other scheme for international coöperation without encountering serious objections, frankly expressed opposition in some cases, and positive hostility in others; but there are no doubts or conditions attached to any scheme for British-American coöperation, whether in commerce or politics, for every American and Briton feels and knows, without the pressure of argument or propaganda, that it will work.

One of the most noteworthy of the several speeches delivered at these meetings was that of Mr. John Johnstone, Chairman of the British Chamber of Commerce, Shanghai. Mr. Johnstone said in part:

> Most undertakings start in a very small way and if this gathering here to-night proves the success that we, as its promoters, hope for, its eventual growth is unquestionable. For very many years the people of our two nations have worked side by side in China. There have been occasions also in China when we stood side by side in the face of a common foe and fought for our joint rights as well as those of others. To-day only the scene of action is changed. From this land of ancient pagodas and quiet waterways, we pass to the bloody fields of Flanders, where again we find ourselves Allies in a common cause.
>
> In both our respective home countries, gentlemen, the rapprochement between our two peoples which the War has brought about is self-evident. Why should not we in this far distant land take a leaf out of the book now spread open before us: opened, bear in mind, by our own kith and kin who are taking part in a very much more arduous battle, where failure means possible death, and no second opportunity is offered to make good? My simile is possibly rather an extravagant one but what is meant will probably be quite evident to you all. Why should we, out here, continue to work, side by side it is true, and on the best possible terms, but not in conjunction?
>
> China is a vast field, as yet practically unopened, in spite of the fact that foreigners have lived and traded here for practically one hundred years, ourselves among the earliest. Are we going to continue to muddle along on our own and so give our enemies a chance of picking up the threads of their lost opportunities? Or are we going to pull in the one boat? China's people look up to and respect our respective merchants; they have ranged themselves on our side in this great European War and will undoubtedly look to us more and more in the future to guide them. What are we going to say? What are we going to do?
>
> If, as seems the only possible and practical step, we are going to pull together, then we require unity of action, close commercial ties, and mutual understanding coupled with the links of good fellowship and personal esteem. These links are now in course of being forged on the battle field. A great many of them have already been roughly finished, and when the chain is eventually completed and is ready to take its place in the world's show window, I trust that Britons and Americans the world over, may be found within the circle formed by that chain, working together hand in hand and presenting as bold a front to their enemies on the field of commerce as they now do, and will continue to do, on the field of battle. In conclusion, gentlemen, I give you a toast:
>
> Success to all joint American British Enterprise, be it war or commerce.

The Chinese as Mechanics

In the course of an article on "Science in China" in the *North China Daily News*, Mr. Richard Oliver makes the following interesting comments:—

When a scientific man comes out to China for the first time, two things strike him as remarkable. One is the use of man power, instead of steam power. The other is the natural aptitude of the Chinese for the subject called mechanics. They have the mechanical instinct; they are remarkably ingenious; and yet there are few places in the world where mechanism is less employed than in China.

The records of the country show that the nation has produced inventors. A few thoughts about such colossal works as the Grand Canal and the Great Wall of China are sufficient to remind us that engineering ability has not been absent in the past. Any constructional engineer, who even glances at one of the famous pagodas, must realize that the people who built them knew something about mathematics and the science of building construction. If Marco Polo had been an engineer he would have been astonished at the uses to which a bamboo can be placed. Nothing is more remarkable than the scaffolding erected by the Chinese. It is done quickly, it is not costly, and it is extremely suitable for the work. The only possible fault which the critical Westerner has to find in it is that the ubiquitous mosquito finds it a delightful breeding place. And now that the dragon is disappearing as a national emblem for China, the bamboo might well take its place. For the ingenious Chinese has shown all of his best characteristics by the uses to which he has placed that plant.

It should not be forgotten that, long before the days of Marco Polo, the Chinese built good roads and fine bridges. They not only attended to what we may call statics, or constructional work, but they produced mechanisms, such as—if we may trust the name—the Chinese windlass. To them is attributed the invention of gunpowder.

It is very remarkable that the nation, which always strikes the foreigners as a peaceful people, should have invented the first gun. The ancestors of the now famous "Jack Johnsons" and the deadly weapons sheltered by the "tanks," had their birth in China. That is astonishing. But it is even more surprising to realize that the first gun was something much more than a weapon of destruction. It was the first engine which converted chemical into mechanical energy. That simple—or, as we now think it, simple— transformation, was one of the greatest steps in the progress of man. . . .

Concerning the compass, printing, the water clock at Canton, and numerous other ingenious devices, it is enough to mention that these things support the general thesis that the Chinese possess the mechanical instinct. If only the brain power and craftmanship which is revealed in the concentric, but separate, ivory balls had been expended upon mechanism, the history of the world would have been very different.

It is, of course, useless to spend our time in a contemplation of the "might have been's." They are, as the poet reminds us, the saddest of all words; nowhere is the tragedy expressed by them as great as in China. The one great fact that is now before us is that many of the Chinese intellectuals realize the tragedy. They understand that not only is machinery cheaper than human toil, but it is also far more reliable. They know that nature has bountifully provided China with vast stores of natural sources of energy. They are determined to utilize it. And that will bring about a transformation in China which will not only change the whole of this great country, but will affect all of the nations inhabiting this planet. . . . The man power problem exists in every city, village, and hamlet of China. The only solution of it is to provide a better reward for the daily expenditure of energy per man of the nation. . . .

The old Chinese scholars allowed their finger nails to grow long in order to show that they had a great contempt for anything which involved a use of the hands. The practical Anglo-Saxon used the lever, the pulley, and the screw, and he sought out the causes which made them useful. The experimental, as well as the literary, habit of mind was developed. The Japanese saw the modern methods of production of the West, and the efficient organization of the industries and defense forces of the countries which adopted them. They had the choice of the examples of their neighbors who talked, and of those other people who did things. And they chose to adopt scientific methods. In a very few years, as all the world knows, the nation of forty million people had humbled its giant neighbor.

In his intellectual isolation the Chinese scholar may have seen the blundering efforts of his countrymen, who could not stave off defeat. He may have consoled himself with the thoughts of the superiority of his own particular type of knowledge. The Mandarins did express contempt for the materialistic learning of their conquerors. Mandarins of the West have been known to express similar opinions about science. Those clever, ignorant people entirely misunderstood the spirit of the researchist in the laboratory, or the inventor in the workshop, for patient investigation and accurate methods cannot fail to have a refining influence upon those occupied with them. The history of science abounds in deeds of altruism and self-sacrifice. . .

The first essential in science is accuracy. In no country is accuracy so rare as in China, and accuracy can be taught. . . If every Government official, politician, and scribe in China had only one year of training in a scientific laboratory, the great transformation of China would receive a wonderful impetus. The habit of accuracy and exactness in matters of fact, which follows from such a training, would create an entirely new mental outlook among the educated Chinese. . . The academic sciences include physics, biology, geology, chemistry, and mechanics. Of these the most suitable for teaching in schools are physics and mechanics. One of the greatest needs of China of to-day is a school of academic, or pure science, which would train young Chinese in the natural sciences, and which would produce new knowledge about the natural characteristics of the Far East. The Jesuit fathers of Siccawei have established a most excellent center for obtaining records of natural phenomena; but it is an inspiration to students to be in the same institution as the professors who are making new discoveries and obtaining new data. The Bureau of Science in Manila is excellent. To effect the great transformation, schools of pure, or academic science, are badly needed in China.

Under the heading of applied science come the medical, engineering, and economic sciences. A beginning has been made, and there are several schools in China in which such subjects are taught. Attention will be directed to the inevitable results of the utilization of such knowledge by the Chinese.

Until recently China had exploited only one of the three kingdoms of nature. In order to add to the wealth of the people, so that their condition may be less precarious, improved methods of communication are essential. Good roads are of even greater importance than railways. England built the Grand Trunk Road from Calcutta to Peshawar. If a similar highway between Canton, Hankow, and Peking could be built, and maintained, in a manner suitable for motor traffic, it would be a splendid thing for China. Practically all of the cost of construction would be spent in wages. There is ample and cheap labor; proper supervision and expert advice is essential for the success of any such scheme. There should be a proper system of roads in each province in China, as well as trunk roads, mapped out by the Central Government.

Little need be said about the railways, for, as somebody has truly remarked, the politics of China have been, for some years, railway politics. It is worth noting, however, that British engineers have always done their utmost to train young Chinese as railway engineers. They initiated the Tongshan College, and quite recently, Mr. A. C. Clear has formulated a splendid scheme of training and employment for those who aspire to be railway engineers. Not only the railways, but the telegraphs come under the direction of the Ministry of Communications. Good roads will facilitate postal arrangements, and lead to a spread of the most rapid method of communications known to electricians.

The introduction of machinery into the domain of agriculture was a feature of the past thirty years in America, Canada, Russia, and other areas. It has appeared in Manchuria. Electricity is now used in agricultural work. The former is always conservative, but even the Chinese farmer will adopt methods which will increase his income, if he knows about them.

Science has taken root in China and it will spread. It will do more for the people than all of the ambitious programs of political parties. It has shown its effect in Britain, for the people of that country have not only become wealthy by the utilization of the forces of nature; they have become free from aristocratic tyranny and intellectual superstitions. In Germany, science was captured by the autocratics and prostituted by them for their own selfish purposes. But science will decide the war in favor of the eternal principles of justice and liberty, for which she has always striven. She will do the same for China. She will strike off the shackles of superstition and ignorance; she will banish starvation and floods; she will cause the earth to multiply nourishment for the people; and she will liberate the masses from the grinding toil of almost ceaseless manual labor. All that is needed is shrines for her votaries and a constant stream of young priests who will devote their lives to the high aims which she demands of all her true followers. The Chinese have always reverenced learning. Now is the opportunity for wealthy citizens of the Far East to establish schools of science in the treaty ports, so that the new type of learning may spread from many centers. For science tells us not only the story of the plant, the race, and the earth; it gives us a knowledge of the internal structure of the atom and the majestic progress of the sums; it teaches us to make order out of chaos, and it bids us lift human existence out of squalid misery into a state Godlike in its freedom from anxiety and certainly of the majesty of nature. It has commenced its work in China; the dawn of the new era has come:

For, while the tired waves, vainly breaking,
Seem here no painful inch to gain,
Far back, through creeks and inlets making,
Comes, silent, flooding in, the main.
And not by eastern windows only
When daylight comes, comes in the light;
In front the sun climbs slow, how slowly!
But westward, look! the land is bright.

China's Customs Revenue

The maritime customs revenue for 1917 shows an increase of 400,000 haikwan taels. The total collection is reported to be 38,177,000, which at the average exchange rate of 1917 equals £8,241,857 sterling (Gold $39,322,310) as compared with 37,764,000 haikwan taels, which, at the average exchange rate for the previous year equals £6,264,496 sterling (Gold $29,833,560) for 1916.

The following, in round numbers, are the collections of principal ports, all in 1,000 taels:

Harbin, 1,235, increase 299
Autung, 1,099, increase 357
Dairen, 3,088, increase 1,056
Tientsin, and Chinwangtao, 3,556, decrease 133
Kiaochow, 1,864, increase 165
Hankow, 3,767, decrease 243
Shanghai, 11,214, decrease 190
Swatow, 961, decrease 163
Canton, 2,332, increase 109

The collections of Antung and Dairen constitute records. All foreign obligations secured by the customs were fully met up to December 31, 1917.

The revenue from native customs under the Inspector-General's control amounted to 3,775,000 taels, which equals £814,967 sterling (Gold $3,888,250).

Hongkong & Shanghai Bank Dividend

The Manager of the Hongkong and Shanghai Banking Corporation has received a telegram from the head office stating that, subject to audit, the Directors will recommend at the forthcoming meeting:

A final dividend for the year of £2 3/- per share subject to deduction of Income Tax.

Bonus in addition to dividend of £1. 0/- per share subject to deduction of Income Tax.

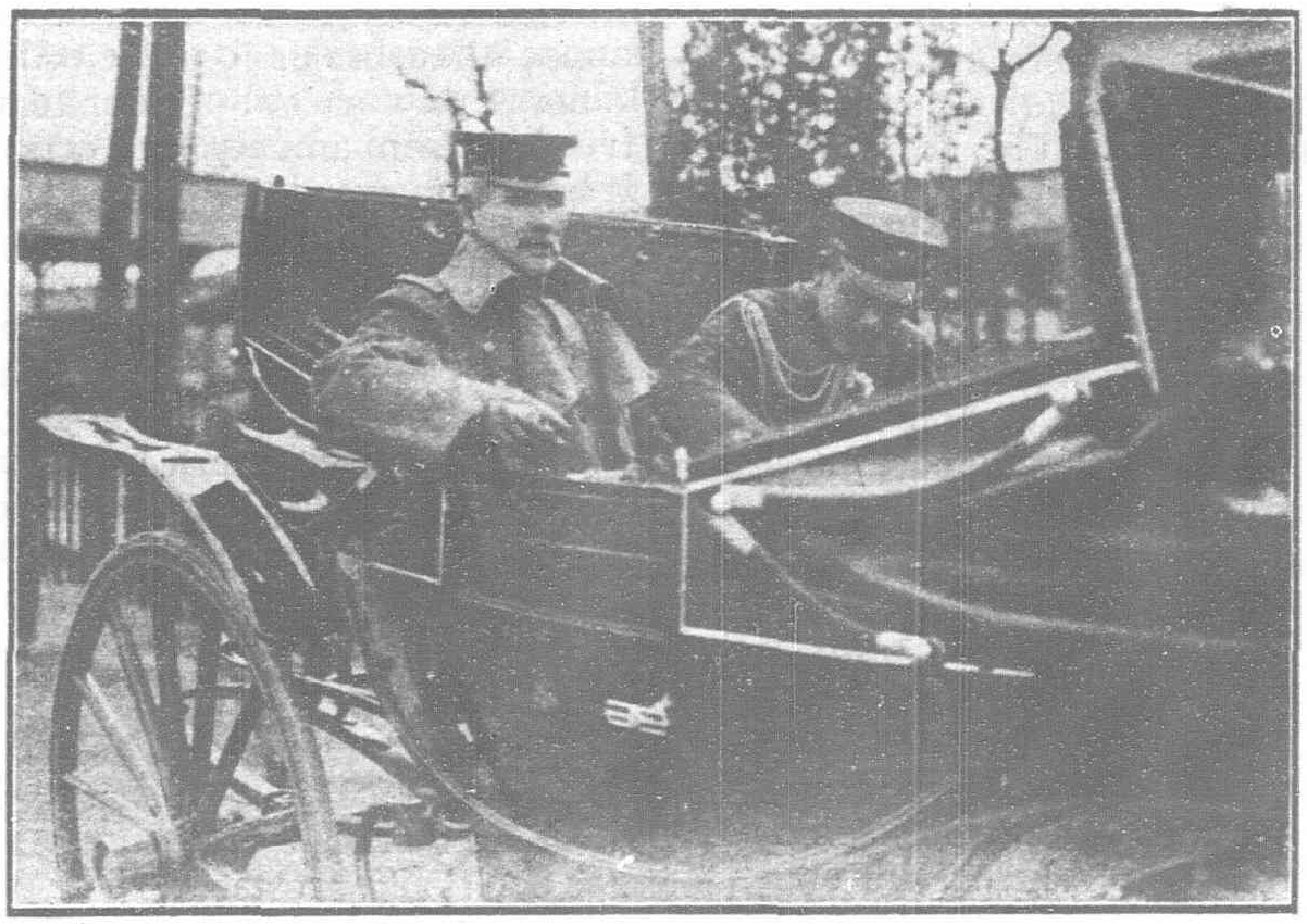
Added to Silver Reserve	$1,000,000
Written off Bank Premise Account	1,000,000
Carried forward to next year about	3,200,000

Changing Korea

Reforms and Progress under Japanese Administration

The remarkable progress made by Japan in the development of the old crumbling kingdom of Korea is further emphasized in the "Report on Reforms and Progress in Chosen (Korea) for 1915-16." China has much to learn of the administrative efficiency of Japan from this document.

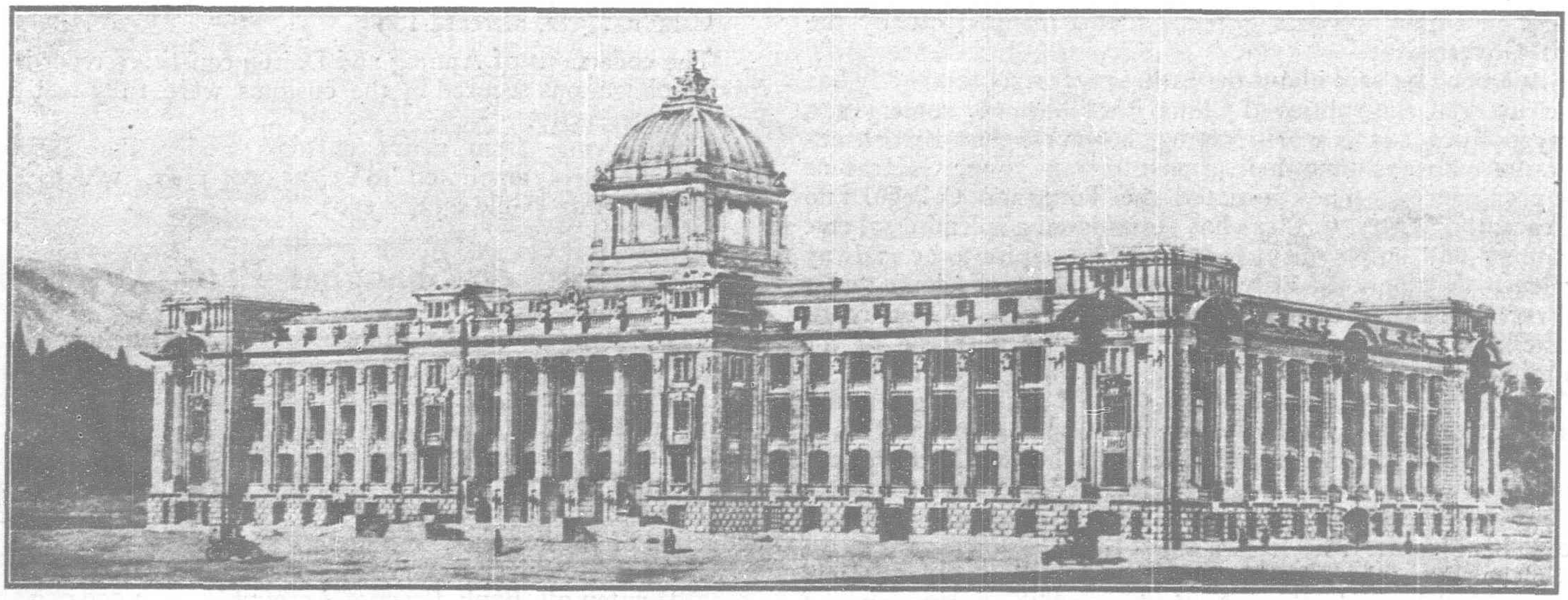
Several years having elapsed since the inauguration of the new régime necessitated by the annexation of the Peninsula by Japan, the Government-General held in the autumn of 1915 an Industrial Competitive Exhibition at Keijo (Seoul) to commemorate the fifth anniversary of the new régime.* The exhibition presented in concrete form the advance or development made during the new régime in many branches of agriculture, commerce, industry, communications, education, and sanitation, by means of exhibits of agricultural and industrial products, and models or miniatures of various industrial plants, communication facilities, sanitary measures, and educational works, with illustrative diagrams and brief statistics. Reviewing the development of the Korean agricultural and industrial products exhibited, as shown by statistics, the returns for all the products of the Peninsula totaled over Y. 300,000,000, more than double that for the year of annexation. The production of rice, the chief agricultural staple of the Peninsula, which stood at a little less than 8,000,000 koku, (a koku equals 4.962 bushels) increased to over 12,000,000 koku; wheat, including barley, increased from 3,500,000 to 6,600,000 koku, beans from 2,400,000 to 3,500,000 koku, cotton from 11,000,000 to 45,000,000 kin, mineral products from Y.6,067,000 to Y.10,515,000 in value, marine products from Y.8,140,000 to Y.13,234,000, and the output of factories from Y.19,000,000 to Y.45,914,000. Trees planted for afforestation during the past six years numbered over 250,000,000. The exhibition contained 48,765 exhibits, and the total expenses of the exhibition amounted to Y.496,843. The period of the exhibition was fifty-one days, September 11 to October 31, during which time the total number of visitors reached 1,164,383, or an average of 22,831 visitors per day. The general public, especially the Korean, had in it a unique opportunity to appreciate the progress made in the material and moral development of the country under the new régime, and it proved a very strong stimulus to further improvement.



Marshal Count Hasegawa, New Governor-General of Korea

Financial Improvement

The State finances during the protectorate régime were scant and complicated, so much so that the total revenues of the former Government, amounting to Y.23,000,000 on an average each year, including a loan of several million yen advanced yearly by the Japanese Government without interest, hardly covered the State expenses, while Y.14,700,000 on an average each year, in addition to military expenditure, was also defrayed by the Japanese Government for the maintenance of railways, posts, telegraphs, telephones, law courts, and the Residency-General. Along with various financial reforms and improvements, especially by establishing the special account of the Government-General as distinct from the Imperial Government account after the annexation, all the Government expenses in Korea were to be met by taxes and other receipts



New Government-General Office of Korea to Be Completed in 1924

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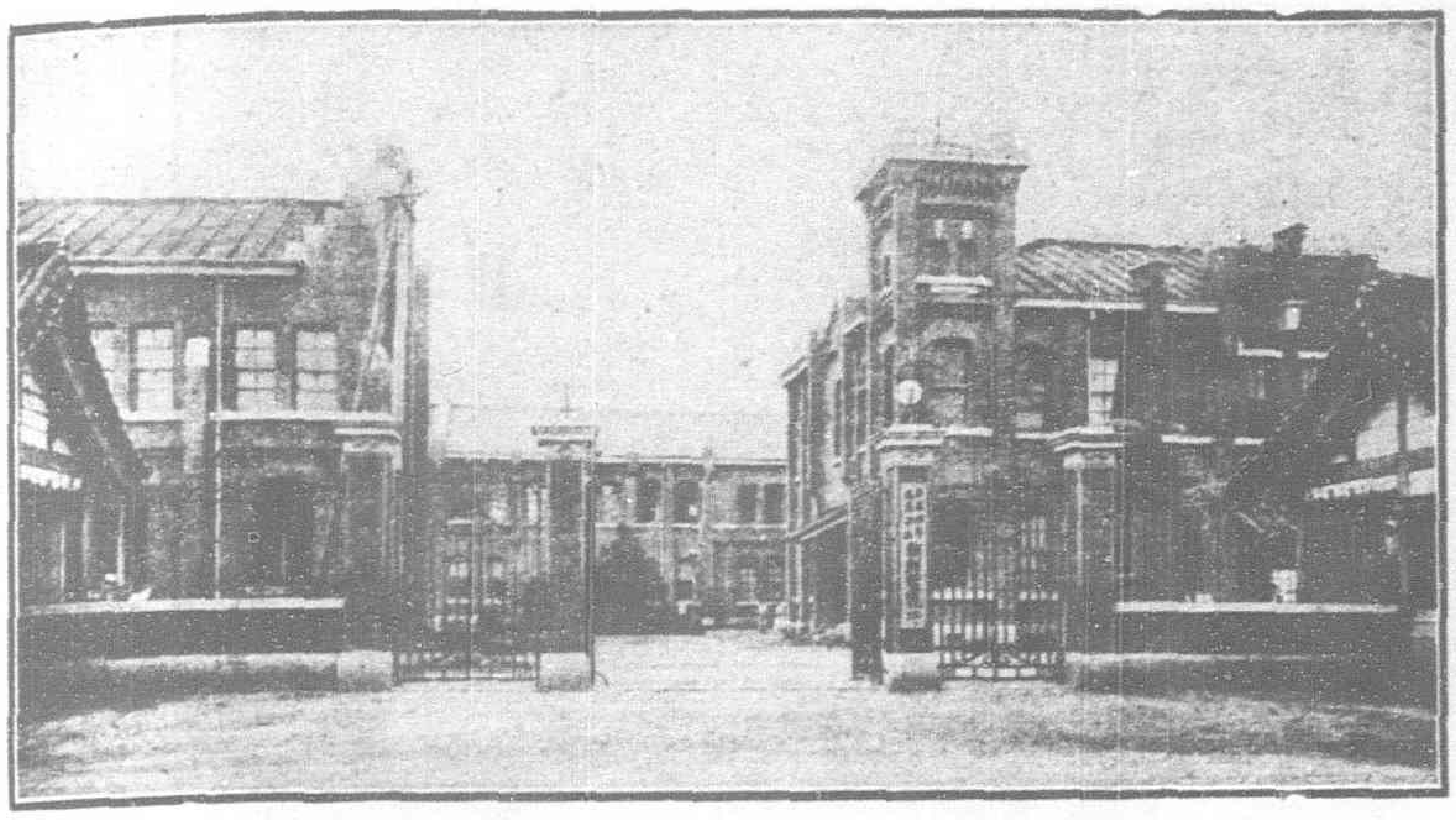
* Korea was annexed to Japan in August, 1910, but before that she was a protectorate of Japan for four years, during which time certain reforms and progress were instituted.



ORIENTAL TOBACCO CO.

CIGARETTE MAKING

collected in the Peninsula, and the deficit, if any, to be made good by the Imperial Treasury of Japan, so that all Government expenses in Chosen, except military expenses, were to be discharged out of the revenues collected in the Peninsula in the near future, and the total revenue for 1911 was Y.52,284.464, of which Y.12,350,000 was granted by the Imperial Government. Financial readjustment being continually carried out by curtailing, on the one hand, its administrative and other expenses as far as possible, except those incurred in giving encouragement to productive undertakings and education, and by augmenting, on the other hand, the revenue by levying new taxes and readjusting revenue sources in such a way as not to lay any unnecessary burden upon the people, the Government-General finally drew up a plan for establishing fiscal independence of the Home Government within five years from the fiscal year 1914. Thus the annual grant from the Japanese Government amounting to Y.12,350,000 being gradually reduced year by year, it appeared as Y.7,000,000 only in the budget for the fiscal year 1916, while the total revenue for the same year, including this grant, swelled to Y.59.848.998. The annual grant will disappear from the budget for the fiscal year 1918, when fiscal independence will be established in the Peninsula.

Foreign Trade

The foreign trade of Korea was originally very insignificant, especially in regard to export, which, before the beginning of the Japanese protectorate (1907), amounted to Y.8.000,000 only, with an import of two or three times that sum. During the protectorate régime (1907-1910), the exports more than doubled, yet excess of imports was always in evidence. As the sequel of agricultural and industrial encouragement, the export trade gradually increased after the annexation and grew remarkably in later years so that it reached Y.49,492,000 in 1915 and Y.56,801,000 in 1916. The import trade also increased, but the very conspicuous feature of considerable excess of imports over exports, prevailing for many years and going up to over Y.46,000,000 in 1912, was greatly lessened by the increase in exports from 1915 onward and "the so-called unfavorable balance of trade" has become less significant. In short, the foreign trade of Korea during the past eleven years has increased by more than three times (Y.39,207,031 in 1906 and 131,258.739 in 1916), or six times in exports and more than two times in imports.

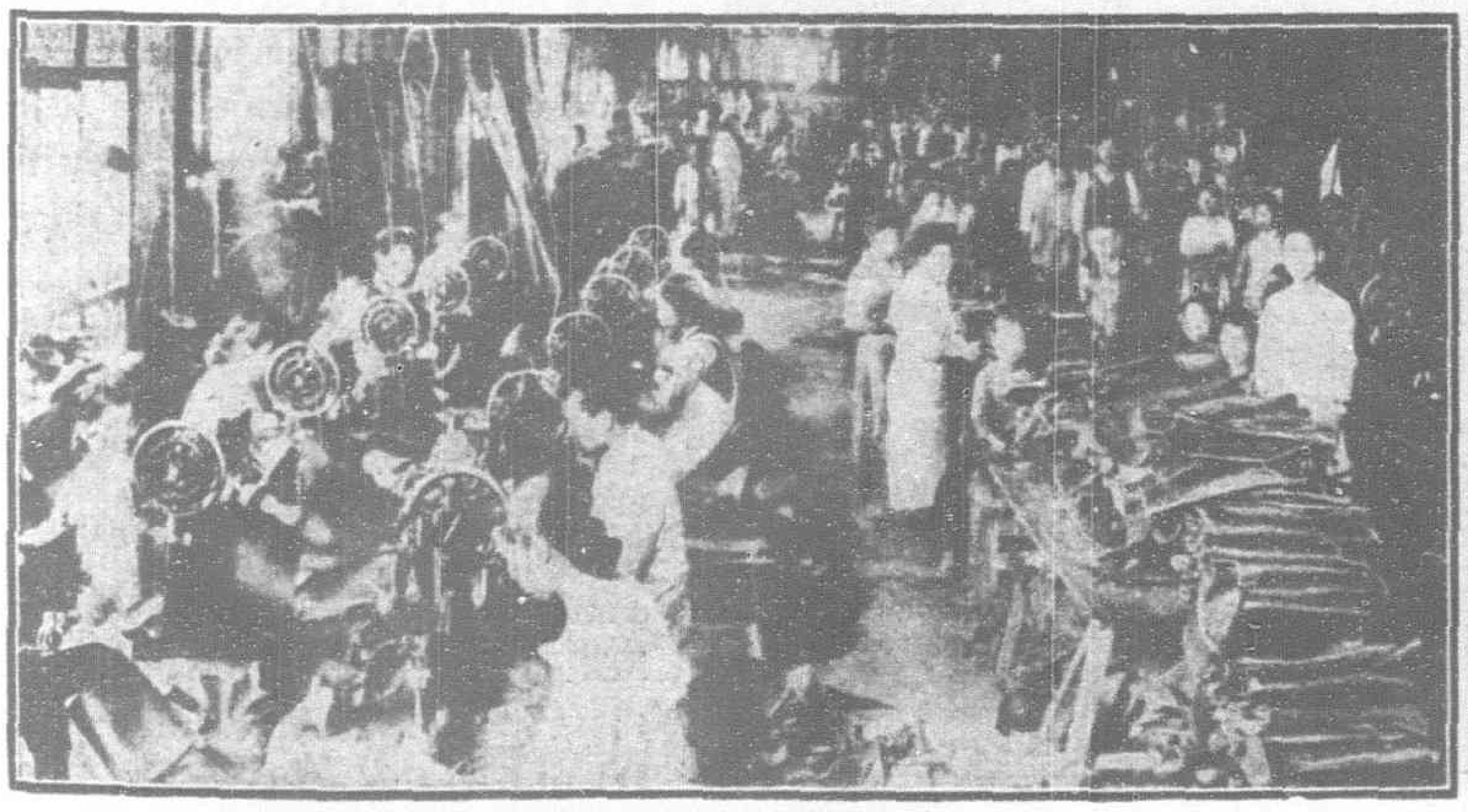
At the time of the coronation of the Emperor of Japan (November, 1915) occasion, 10,092 prisoners had their sentences commuted, while Y.200,000 was given to Korea from the Imperial purse to be expended in charity.

Treatment of Koreans

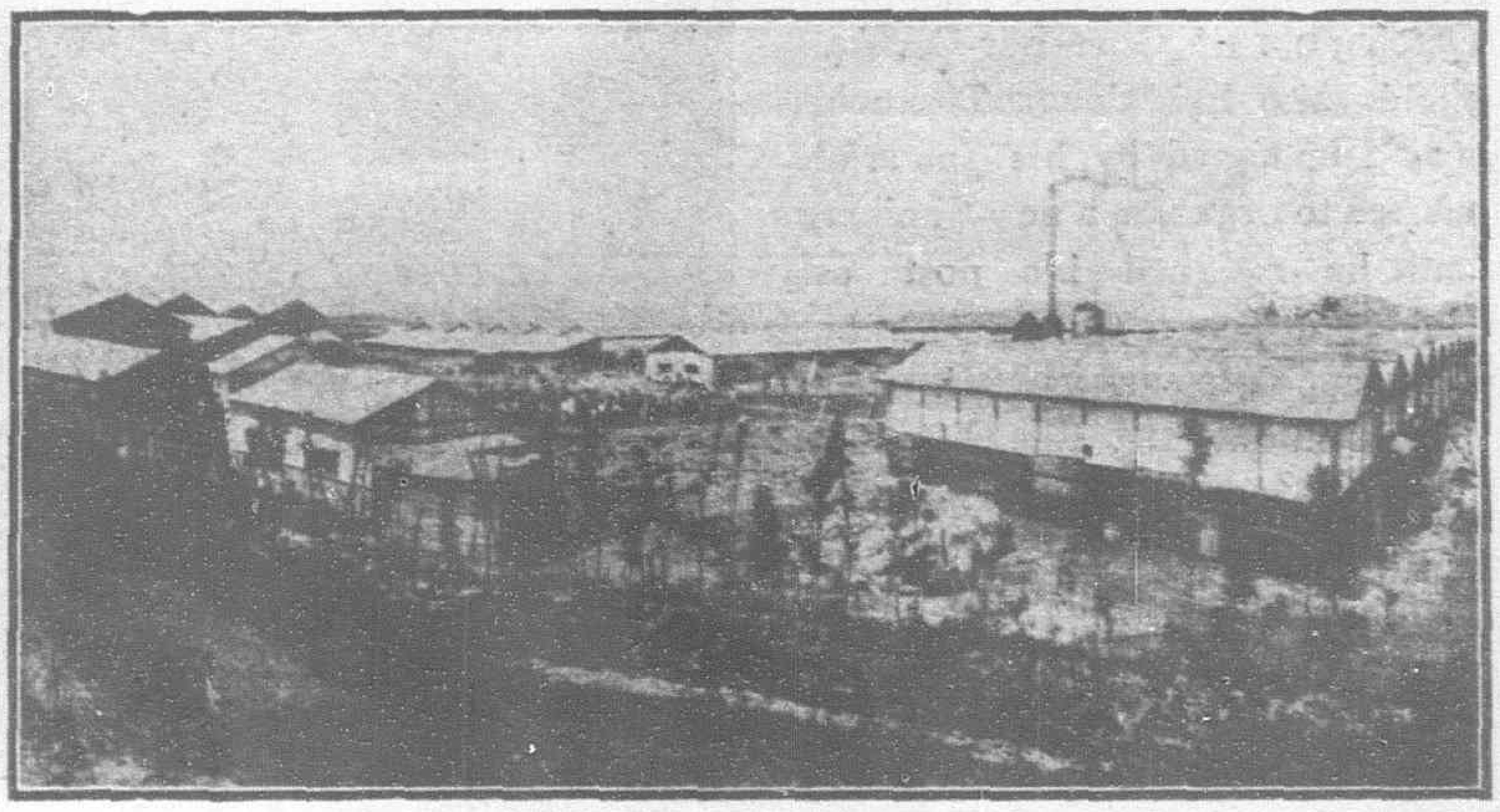
As already alluded to, in order to establish fiscal independence in the Peninsula financial retrenchment was rigorously carried out, especially by curtailing administrative expenses. But neither the Imperial Government nor the Government-General ever tried to cut down the annual allowance of Y.1,500,000 granted to Prince Li's Household out of the budget of the Government-General, which amount was the same as that Prince Li received when he was Emperor, notwithstanding His Highness' Household has been rearranged on a much simpler footing.

The legal status of Koreans is much the same as that of Japanese, the more so as the Japanese civil and commercial law was made applicable to Koreans and Japanese alike as a general principle in April, 1912, while certain exceptions in the law of person have been made for Koreans so as to give them benefit of their own peculiar usages. Further, according to Dispatch No. 240 of the Civil Governor, issued on August 7, 1915, the marriage of Korean women to Japanese and Japanese women to Koreans is legally recognized.

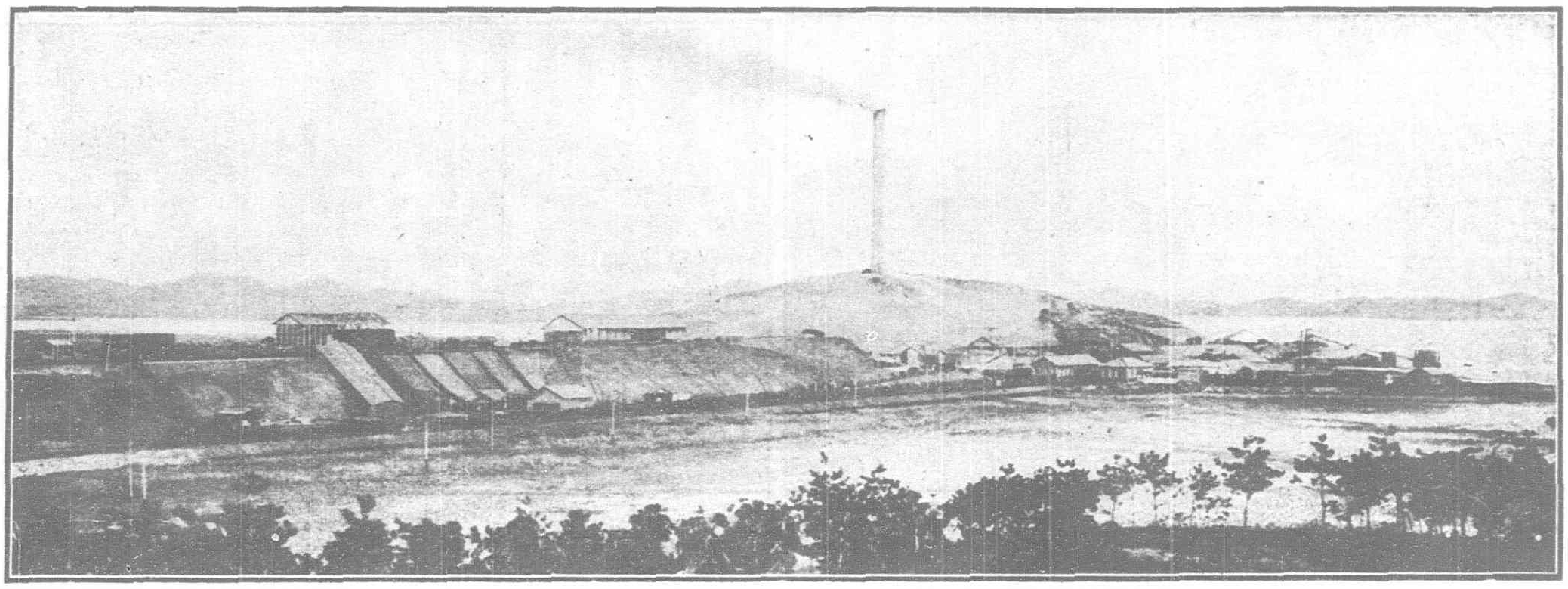
The spread of Japanese, or the new national language, among the Koreans has been so remarkable that students in common schools after two years' study cannot only understand lessons given in Japanese but freely talk in it, and textbooks used in high schools are now all written in Japanese with the exception of reading books for the Korean and Chinese languages, and students in the Higher Professional Schools can take notes of the lectures in Japanese. The educational authorities are of course making serious efforts for the spread of the new national language among the Koreans. Since the new educational system came into force in 1911, the Japanese language has been made an obligatory subject in the curriculum of Government and Public Schools. Private



BOOT-MAKING SECTION BUSY ON BOOTS FOR RUSSIAN ARMY



TANNERY WHOSE OUTPUT HAS GONE LARGELY INTO RUSSIAN BOOTS



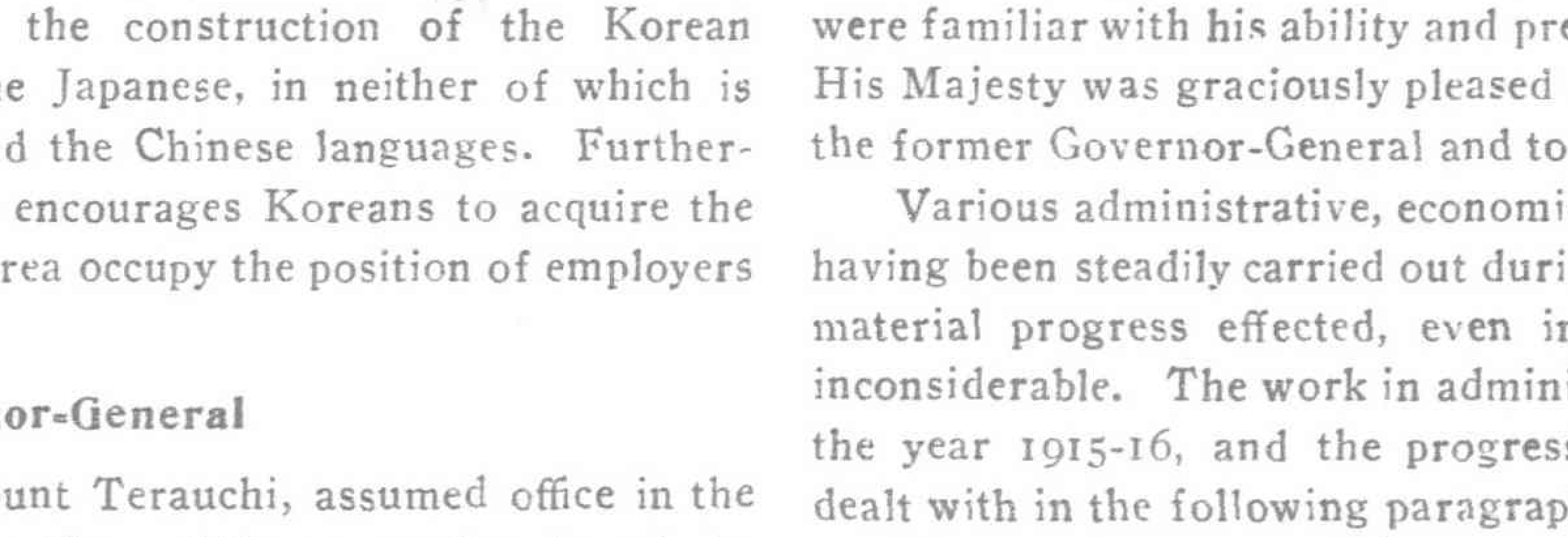
Gold Smeltery Erected by Kuhara Mining Company at Chinnampo, Korea

Schools maintained by Christian missions and others have not been slow in adopting it as a regular subject of study, and the new private school regulations enforced in 1914 require all private schools to teach the Japanese language as a regular course. In addition, over four hundred public common schools are now holding night schools for the national language, while the gendarmery and police and other bodies have organized more than 2,000 new national language associations. Not only are Koreans natural linguists, but the construction of the Korean language is very similar to that of the Japanese, in neither of which is the verb reflective, as in European and the Chinese languages. Furthermore, the present economic influence encourages Koreans to acquire the Japanese language, as Japanese in Korea occupy the position of employers of Koreans in many cases.

The Governor-General

When the Governor-General, Count Terauchi, assumed office in the Peninsula by Imperial Order at the time of the annexation (1910), he issued a proclamation in which he stated the reason for bringing Korea under the Imperial rule of Japan, the treatment to be conceded to all classes of the annexed people, etc. After five years' administration under his directorship, His Excellency issued, on January 6, 1916, a proclamation in which he reviewed the advancement made in administration, finance, education, sanitation, etc., in the Peninsula under the reign of their Imperial Majesties, the late Emperor Meiji and the present Emperor, expressed his appreciation of the coöperation of officials under him, and the sympathy constantly exhibited by the people; at the same time he strongly pointed out to the general public that the works done in the past were only the beginnings of progress, and that still greater exertions must be made by officials and people in close coöperation to secure the continued welfare of the Peninsula and the Empire at large, and so fulfill the Imperial wishes.

When Count Okuma resigned office as the Minister-President of State, or Premier, in Japan, on October 9, 1916, Governor-General Field Marshal Count Terauchi was summoned by his Imperial master to organize a new Cabinet, and he resigned his post as Governor-General of Chosen on his appointment as Minister-President of State. Field Marshal Count Hasegawa was appointed Governor-General in his stead on October 16, 1916. The development of the Peninsula under the administration of Count Terauchi, covering nearly six years, made great advance by reason of his unique organizing ability and his untiring efforts, though certain reforms had been initiated under the wise advice and careful guidance of the Resident-General, Prince Ito, during the Protectorate régime. Count Hasegawa having served in the Peninsula as Commander-in-Chief for a period of over two years, during which he often acted in capacity of Resident-General in the absence of Prince Ito, his appointment was greatly appreciated by the people, especially by those Koreans who were familiar with his ability and prestige. On the change being effected, His Majesty was graciously pleased to address words of appreciation to the former Governor-General and to his successor.



Smelting Furnace with Water Jacket at Chinnampo, Korea

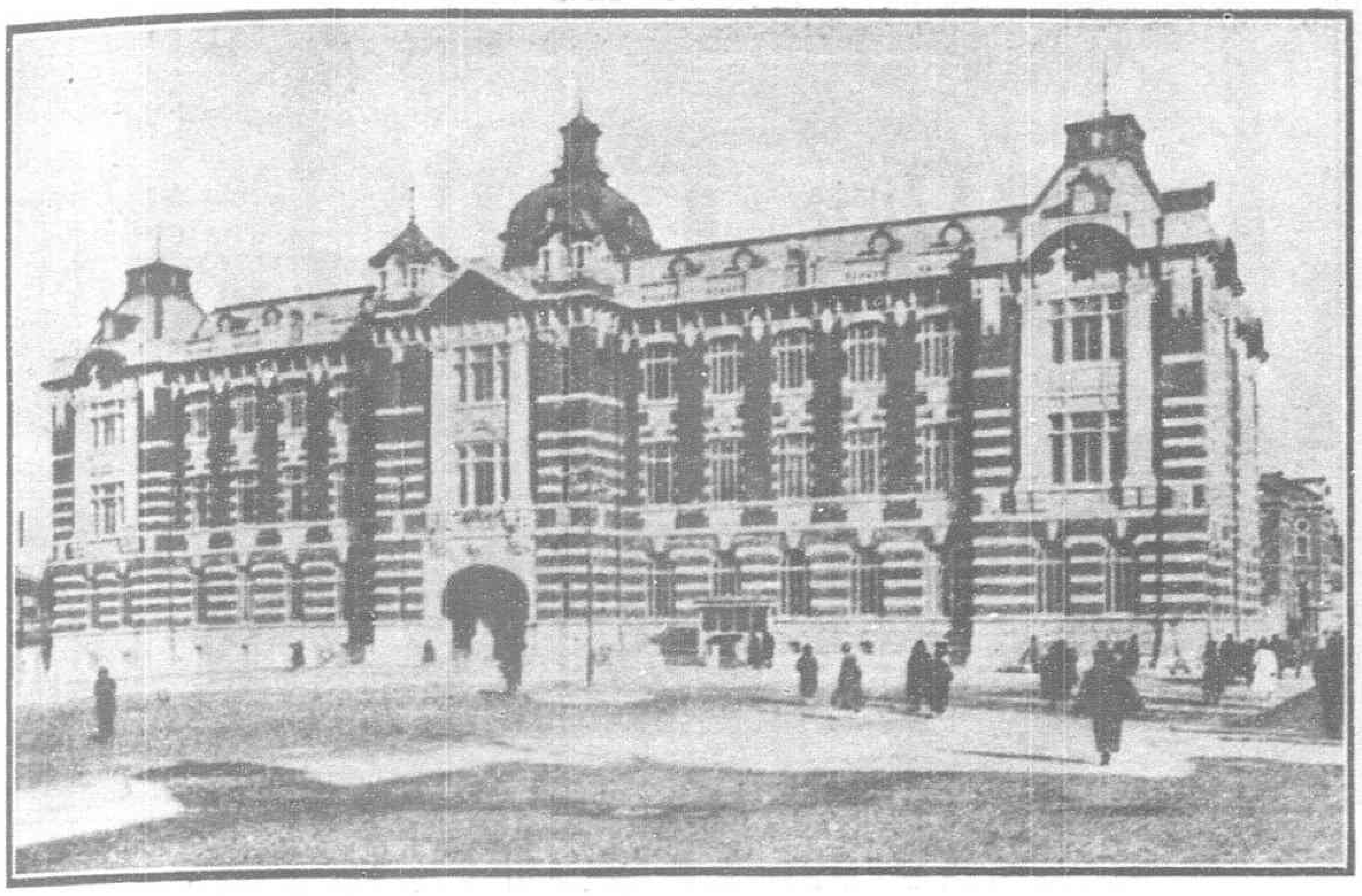
Various administrative, economic, educational, and sanitary measures having been steadily carried out during the past few years, the moral and material progress effected, even in so brief a period, is by no means inconsiderable. The work in administration and other undertakings for the year 1915-16, and the progress made during several years past, are dealt with in the following paragraphs:

The total number of Government officials and employees paid out of the State revenues at the close of the fiscal year ending March 31, 1916, was 38,166, of whom 17,230 were natives. In addition, there were 4,146 officials and employees (including school-teachers) maintained out of the revenues obtained from local levies, Imperial Donation Funds, Japanese School Association Funds, and Korean Common School Funds; of this number 1,599 were Koreans.

Though the Japanese officials and employees outnumber the natives at present, with the educational growth of the Koreans Government positions in the future will be filled by natives much more freely than has hitherto been the case.

Investigation Works

With a view to furnishing material or reference for the improvement of administrative measures and for the development of agriculture and industry, various investigation works were carried out. Beginning with the investigation of old usages and land survey, including cadastre, there were set on foot to stimulate the industrial growth, surveys of mineral deposits and forests, and investigations of marine products, industrial products, revenue sources, and rivers and harbors. In addition, an archæological investigation and the collection of material for the compilation of a complete Korean history were also undertaken. Of these investigation works, those relating to the industries and the river systems will be treated of



New Post Office, Keijo

in their respective chapters, while the remainder are dealt with in the sections immediately following.

Land Survey

Since the land survey was first begun in the Peninsula over six years have elapsed, and the work in all its branches is now in a greatly advanced stage. Of triangulation surveys, primary triangulation throughout the Peninsula was completed by November of the year 1914, and secondary triangulation by July, 1916. The land survey being carried out primarily for cadastre purposes, necessitating the measuring of each lot of land, geographical features in detail could not be accurately laid down. Topographical surveying, therefore, was begun in April of the year 1914, and 4,870 square *li* had been surveyed by March 31, 1916.

The land survey program was recast as an eight years and ten months' consecutive work from the year 1910 at the aggregate expense of Y.20,406,489; and of this sum Y.13,361,076 had been defrayed up to the end of the fiscal year ending March 31, 1916.

Local Administration Improvement

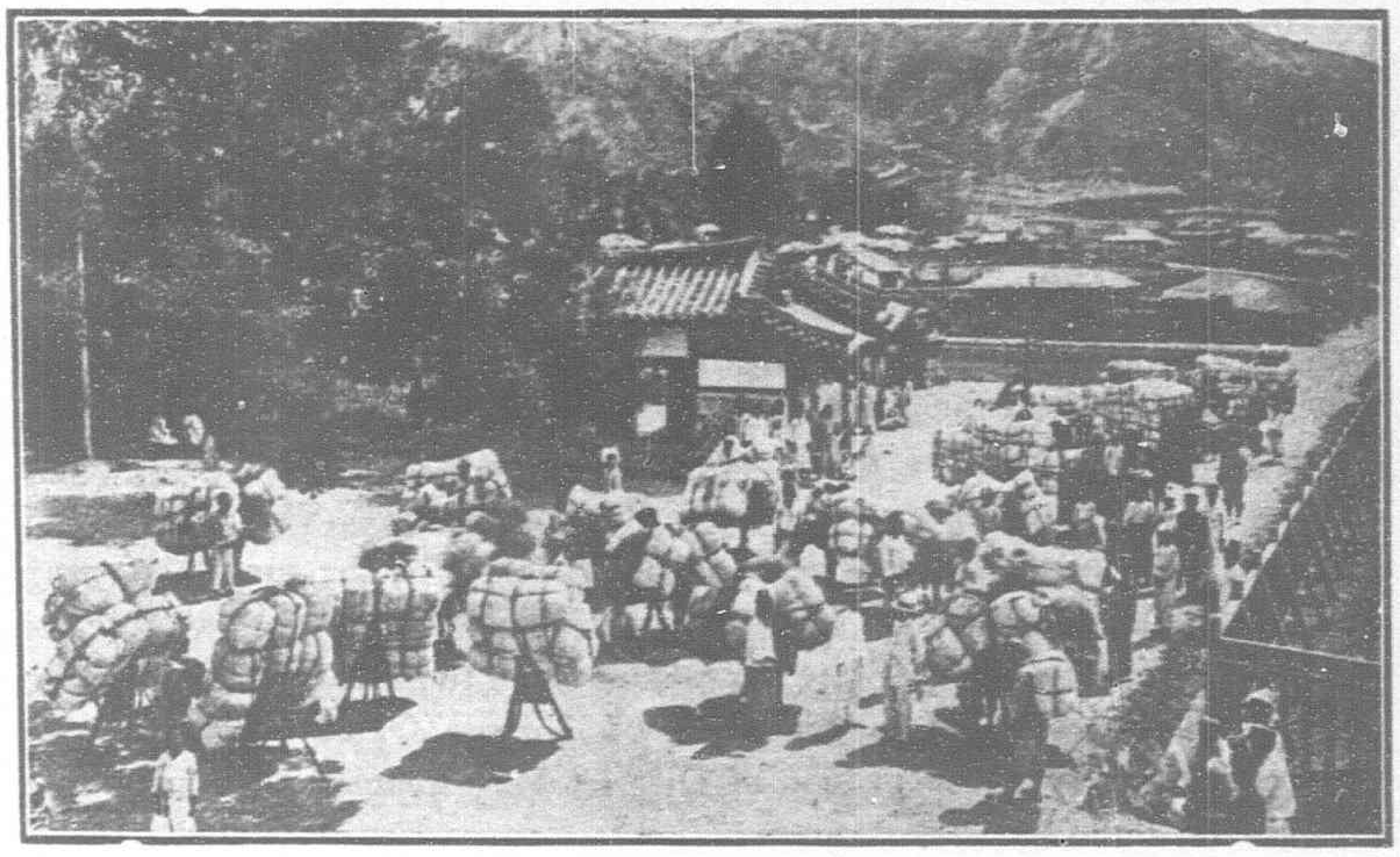
With readjustment of administrative divisions by amalgamating numerous districts and villages, or by creating prefectural municipalities and island districts, and with increase in local finance by readjusting local levies, by utilizing the Imperial Donation Funds, or by receiving liberal aids from the Central Government, the local administration in the Peninsula is improving year by year. With industrial and educational encouragement, and sanitary improvements, the welfare of the local people is greatly enhanced. In contrast to the old régime, under which the country people were too afraid to build fine houses and were content to live in huts in order to avoid official extortion, they now enjoy security of life and property, and are no longer afraid to build two-storied houses or buildings with tiled roofs, if possessed of the means to do so.

With the growth in industrial undertakings and the extension of public works, laborers or the coolie class not only obtain better wages but have fair opportunity to save part of their earnings.

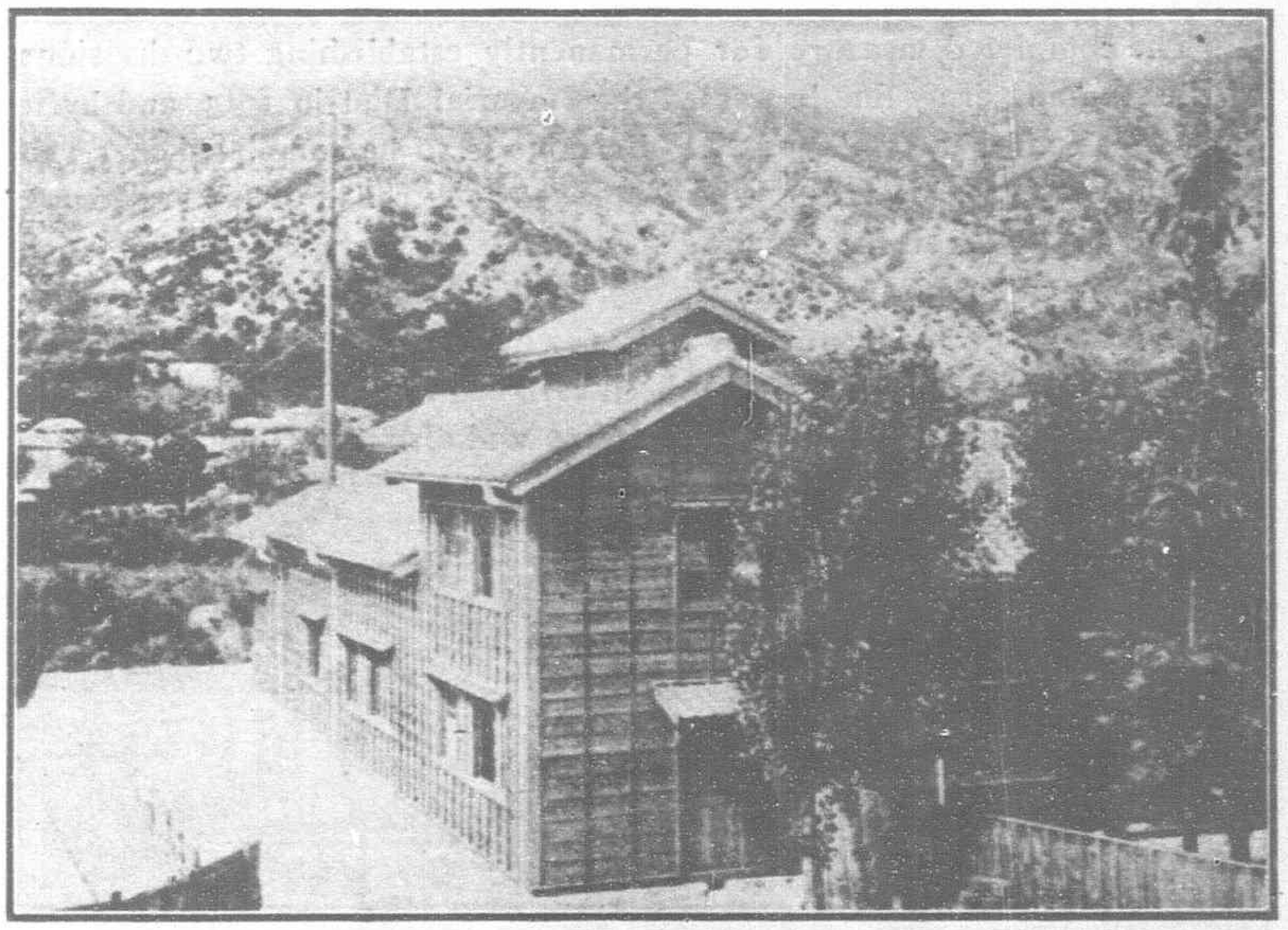
The total amount of office expenses for local governments (Provincial Governments, Prefectural Offices, and District and Island Magistracies) participating in the State administration, defrayed from the State Treasury for the fiscal year 1916, is estimated at Y. 4,273,901, being an increase of Y. 17,000 on that of the preceding fiscal year.

Although the general administrative expenses of local governments are defrayed from the State revenues, yet it is considered proper that the Provincial Governments should themselves furnish, as far as possible, the outlays required for education, public works, sanitation, industrial encouragement, etc., of a local nature, as the business relating to these matters has increased considerably in all the provinces. For these purposes Provincial Governments were authorized to impose an additional levy on the land tax, or to collect minor taxes and fees, as well as to manage public properties, within their respective jurisdictional districts. However, though the receipts from such sources, limited at the beginning, are now on the increase, subsidies are still granted from the State revenue to cover deficits. These subsidies have a tendency yearly to become larger in proportion as the measures for industrial encouragement and public works increase. The total revenue estimated for the fiscal year 1916, balancing the expenditure estimated for the same fiscal year, reaches Y.3,022,182, showing an increase of about Y.354,418 on that of the preceding fiscal year. This increase is due to the gradual augmenting of revenue sources. The increase in expenditure is caused by a pronounced increase in the amounts apportioned for industrial encouragement, educational measures, and civil engineering.

Koreans Bringing Cocoons for Coöperative Sale



Cocoons on Coöperative Sale Ready for Shipment



Keijo Training Station for Sericulture Supported by Imperial Donation Fund, Cocoon Steam Drying House

Training in Sericulture Supported by Imperial Donation Fund

Training in Silk Spinning Supported by Same Fund

Villages being the lowest in the administrative divisions, a village headman engages and assists in the administrative business of a village under the guidance and control of the District Magistrate. Village Headmen being exclusively selected from among the Koreans, they are appointed or removed by the Provincial Governors. The Village Headmen are at present chiefly participating in collecting State revenues and local levies. The status of villages and the administrative function of headmen are now under consideration so that they may be definitely specified.

Unlike the expenses of provinces, prefectures, or Districts, those of villages are not defrayed from the State Treasury. The expenses of Village Offices are defrayed from additional levies on the rural house tax or urban building tax and the land tax, from fees given to villages as commission for collecting State taxes, and from the income derived from village properties. The management of Village Office accounts being now under the strict supervision of District Magistracies, they have been brought into good order.

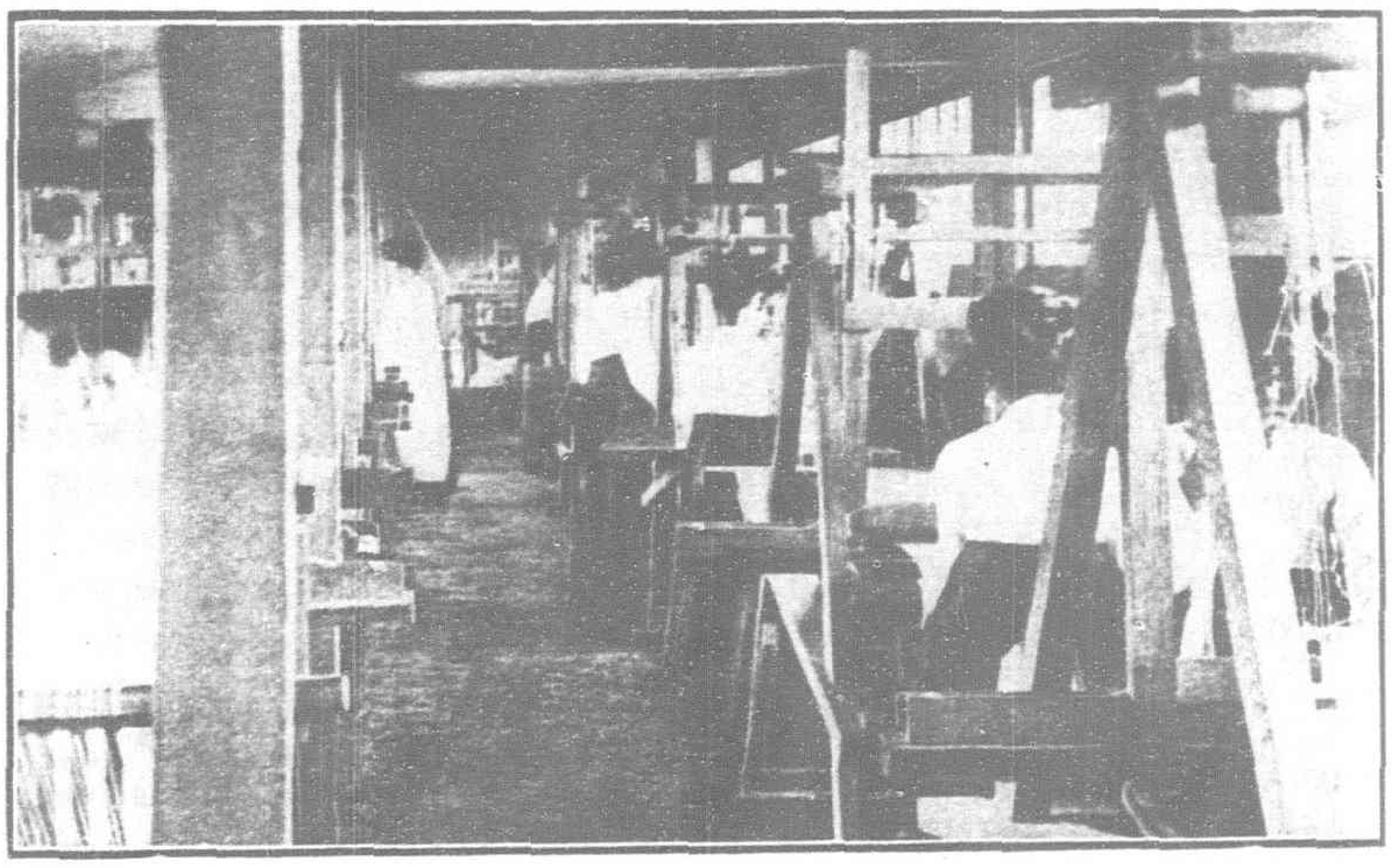
Peace and Order

The completed measure for permanently establishing two divisions of the standing army finally passed the Imperial Diet in 1915, and by it the formation of the 19th and 20th divisions is to be completed in seven consecutive years, beginning with 1915, at the expense of Y. 11,986.058.

Of the police force totaling 5,601 and of the gendarmery force discharging police duty totaling 7,929, native assistants number as many as 2,919 in the police force proper and 4,627 in the gendarmery. Although independent duty has not as yet been assigned to native assistants, they are gradually improving in their discipline and also in their acquaintance with the new national language.

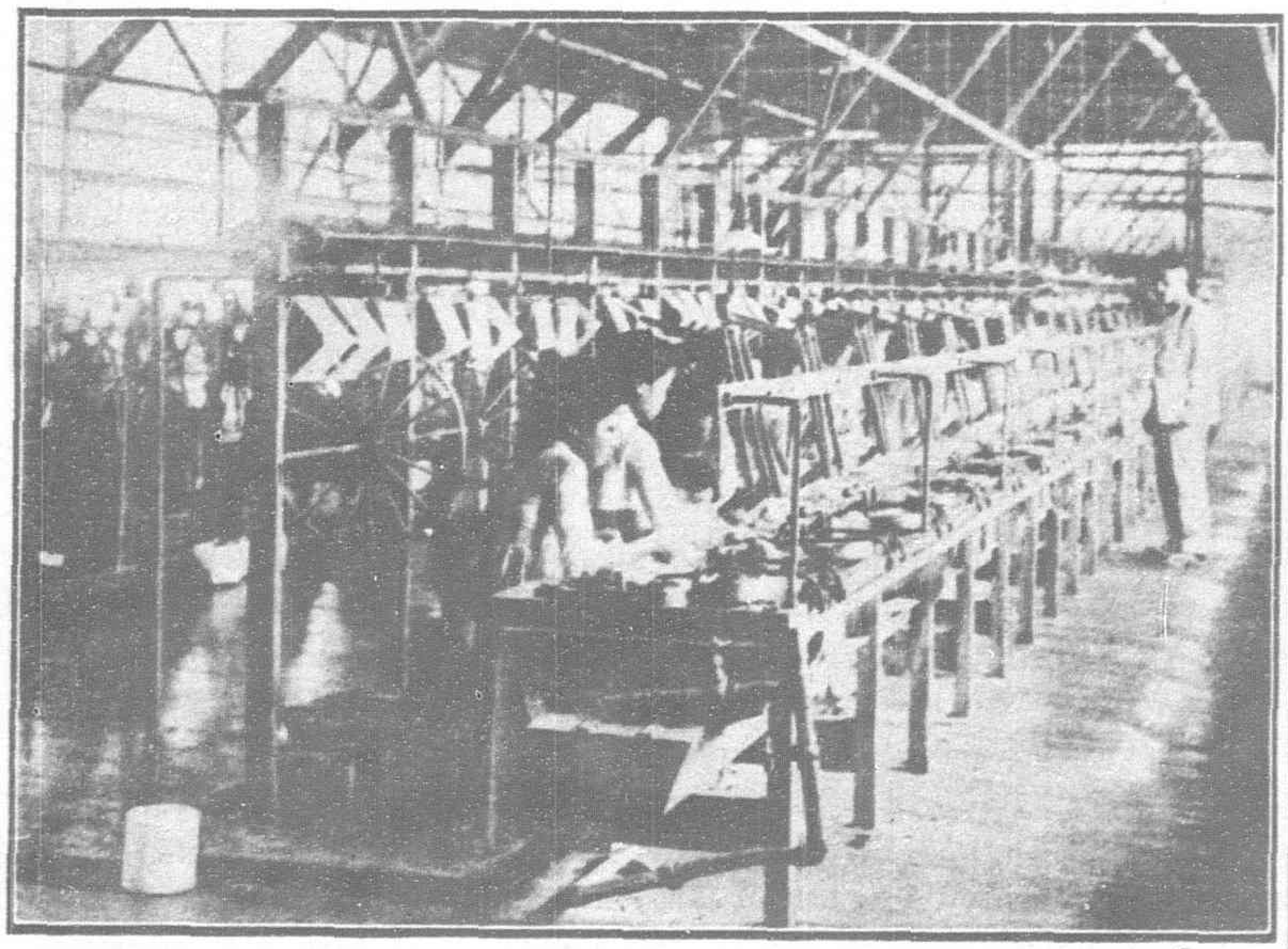
Receipts from Public Undertakings and State Properties

Receipts belonging to this category are steadily on the increase year by year, so that estimates for the fiscal year 1916 aggregate Y.20,098,385, being an increase of Y. 1,481,714 over the estimates for the preceding fiscal year, as shown in the following table:

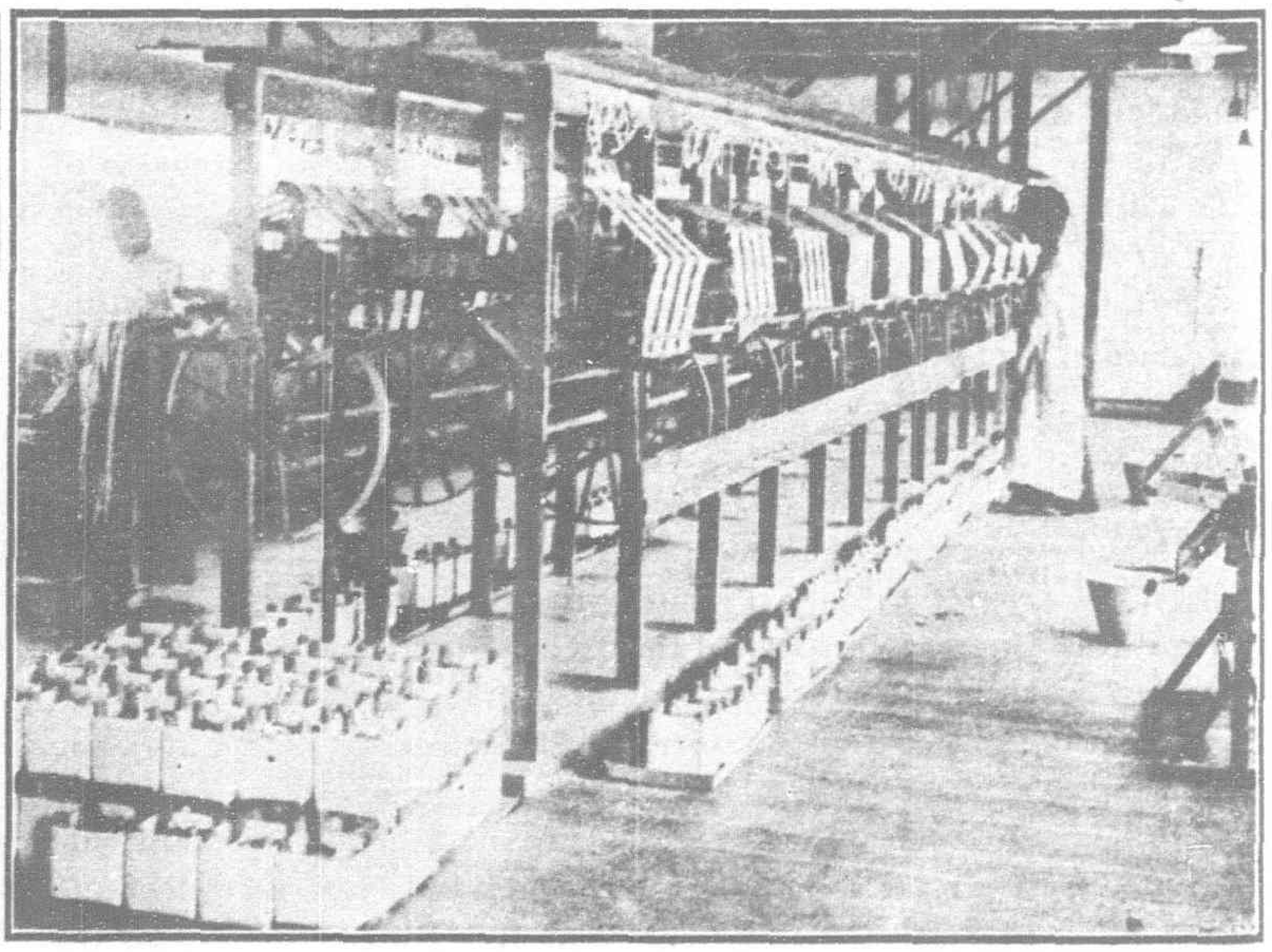


Training in Weaving Supported by the Fund

Description	Estimate for Fiscal Year 1916 Yen	Fiscal Year 1915 Settled Account Yen
Railways	10,149,039	8,934,429
Post, Telegraphs, and Telephones ...	3.738.060	3,422,745



Reeling Silk Threads



Re-Reeling Silk Threads

Hejio (*Pyong-yang*) Coal Mine ...	1,460,960	1,611,249
Printing Office	387,200	325,219
Waterworks	436,655	384,980
Weights and Measures	184,630	162,361
Ginseng Monopoly	1,698,050	1,396,685
Salt Manufacture	269,864	219,730
Lumber Undertaking	—	177,289
Forest Products	139,383	100,215
Lumber Undertaking Station ...	1,362,501	—
Publication of Textbooks and Calendars	31,021	30,168
Fee for Using State Properties ...	40,372	46,360
Sale of Articles Made by Convicts ...	200,650	162,590
Total	20,098,385	16,974,021

But the actual receipts for the fiscal year 1915 were considerably lower than the estimates so that there was a shortage of Y.1,642,650. Such significant decrease was caused by the falling off in receipts from the railways, and posts and telegraphs, brought about by the European War and the consequent economic depression, and that in spite of the increase in receipts from the Heijo Coal Mine.

Bank of Chosen

Along with the considerable growth in the economic circle of the Peninsula, the business of the Bank of Chosen, acting as the central bank of the country, has also expanded exceedingly during the past few years. The business conducted by its branches in Tokyo, Osaka, Antung, Mukden, Dairen, and Changchun being well managed, these branches rendered great assistance in strengthening the financial relations of the Peninsula with Japan and Manchuria. As the economic relations of the Peninsula with North Manchuria and Inner Mongolia may be advanced by reason of the new Chinese-Japanese convention, the bank arranged to open branches in Kai-yuan and Szupinchieh. Seeing the tendency to growth in the trade between the Peninsula and Asiatic Russia, the Bank also arranged to do business in Vladivostok through the Matsuda Bank, already well established there.

Heijo (*Pyöng-yang*) Coal Mines

The output for the year 1915 amounted to 188,078 tons, an increase of 36,000 tons as compared with the preceding year. In accordance with the contract for supplying anthracite coal dust to the Tokuyama Coal Briquet Manufacturing Station of the Imperial Navy, 165,100 tons were dispatched to Tokuyama during the year 1915, while 8,644 tons were made into briquets by the Heijo (*Pyöng-yang*) Coal Mining Station of the Government-General, and 1,912 tons were sold to the general public. The business done by the Hejio Coal Mining Station during the fiscal year 1915, as compared with preceding fiscal years, is as follows:

Year	Output	Quantity Sold	Sales	Receipts Other Sources	Total	Operating Expenses	Number of Working Days
	Tons	Tons	Yen	Yen	Yen	Yen	
1910	100,173	99,466	761,045	923	761,968	731,134	291,185
1911	110,108	99,856	813,662	867	814,529	733,814	348,666
1912	122,414	105,052	898,839	1,087	899,926	819,479	427,785
1913	110,951	102,070	864,007	1,314	865,322	755,644	388,798
1914	151,410	142,295	1,292,957	6,971	1,299,928	1,034,492	509,293
1915	188,078	177,012	1,608,681	2,567	1,611,248	1,252,387	684,958

The total receipts of the Heijo Coal Mining Station for the fiscal year 1915 were Y. 1,611,248, derived from the sale of products. The total expenditure of the station for the same fiscal year amounting to Y. 1,252,387, there was a net profit of Y. 358,861 from this Government undertaking, showing an increase of Y. 93,425 on the previous year.

Lumber Undertaking Station

The area of the forests along the upper reaches of the Oryoku(*Yalu*) and Toman (*Tumen*) rivers, under the management of the Lumber Undertaking Station of the Government-General, is so extensive that forests yielding timber trees are estimated to cover as much as 2,200,000 cho. The investigation and survey of forests in the upper reaches of the Toman River being completed by the year 1914, a similar work was started in the upper reaches of the Oryoku, where an aggregate area of 78,440 cho extending through Kokai district, North Heian province, and Hosan district, South Kankyo province, was surveyed in the year 1915.

The receipts of the station for the fiscal year amounted to Y.1,899,676, the expenditure to Y.1,722,386, and the balance or net profit to Y.177,290. Compared with the preceding fiscal year there were increases of Y.254,966 in receipts, Y.122,813 in expenditure, and Y.132,147 in profit.

Harbor Improvement

At Fusan Harbor, about 90 per cent of the construction of the second wharf, for facilitating the mooring of two steamers of 20,000 tons each, and about 68 per cent of the dredging of the navigable route were completed by the end of the fiscal year under review, while of the construction work of a large wet dock on the lock system in Jinsen (*Chemulpo*) Harbor more than 80 per cent was completed, and of the dredging along its navigable route about 78 per cent. The dredging of Udan Shoal in the Daido River in front of the Custom House at Heijo (*Pyöng-yang*) and landing equipments were all completed in the year 1913, and the construction of an open dock system in Chinnampo was completed in 1915.

River Control and Water Utilization

Rivers of considerable length are by no means few in the Peninsula. But, as often stated in previous Annual Reports, proper care or improvement of the majority of the river systems being neglected, together with the deforestation of mountains, vast tracts of land bordering on rivers are not only left untilled, but many thousand cho of cultivated land are subjected to natural calamities. Furthermore, occasional floods not only cause the loss of thousands of lives but damage navigable streams and serviceable harbors. The last Annual Report stated that, as the preliminary step toward river improvement, with a view to utilizing and controlling streams, General Regulations for River Control were promulgated by Administrative Ordinance No. 46, issued in April, 1914. According to these regulations, construction of or alteration in embankments, bridges, barrages, wharfs, and landing piers, or the drawing of river water by means of pipes, locks, etc., or measures for the prevention of floods, or any other kindred measures should first obtain the approval of the Governor-General, if such affected any one of the fifteen important rivers specified. For measures affecting rivers other than the abovementioned fifteen, approval of the Provincial Governor should be obtained. In the year 1915, three survey parties were dispatched for investigation of thirteen important rivers, and Y.36,538 was apportioned for this purpose.

The investigation of important river systems and the physical features of harbors, including highways, is still of great importance in the carrying out of civil engineering works relating to river, harbor, and road improvements, and waterworks.

For the investigation of these civil engineering works, Y.28,114 was also apportioned for the fiscal year 1915.

(1) As to the investigation of harbors, Seishin and Shimpo Harbors in North Kankyo province, and local ports in North Zenla province, were made the subject of survey and investigation. (2) For investigation concerning waterworks, the amount of water in the Kanko and Nankanko was computed. (3) Investigation of the State roads to be constructed was still continued, (4) while investigation relating to the sewage system to be constructed in the city of Keijo was also begun in the fiscal year under review.

New Offices for Government-General

As stated in the Annual Report for 1913, the present offices of the Government-General are those of the former Residency-General, built in 1907 as a temporary erection of wood, and made use of by the Government-General since the annexation, after repairing or extending them. The building is not only unsuited as offices of the Central Government in the Peninsula, but is located in an inconvenient part of the town, so the Government decided to build offices for the Government-General of a permanent nature in a more suitable quarter. The new building will be constructed at a cost of Y.3,000,000 which will be defrayed in eight consecutive years from 1916. The grounds of Keifukukyu Palace, commonly called "North Palace," have been selected as the site of the new building. The building will cover 2,115 tsubo, and be of five stories containing 181 rooms. It will be built of concrete with iron frame, faced with brick and granite.

Railway Traffic

The total length of railway lines open to traffic, passenger or freight, was 1,006.5 miles at the end of the fiscal year ending March 31, 1916, showing an increase of 125 miles as compared with the preceding fiscal year. On examining operating results, the total train mileage is found to have been 3,544,297 miles, and the total traffic receipts, Y.7,317,793, showing an increase of 108,650 miles in mileage and of Y.900,313 in receipts. Transportation traffic conducted during the fiscal year under review, as compared with previous fiscal years, is shown in the table below:

Chosen Railway Statistics

Year	Length of Lines Open to Traffic	Total Train Mileage	Total Number of Passengers	Weight of Luggage	Total Weight of Freight	Total Receipts From Passengers	Total Receipts From Freight	Total Receipts Total	Average Receipts per Day per Mile From Passengers	Average Receipts per Day per Mile From Freight	Average Receipts per Day per Mile Total
	Miles	*Miles*		*Kin*	*Tons*	*Yen*	*Yen*	*Yen*	*Yen*	*Yen*	*Yen*
1910 ...	674	2,102,122	2,024,490	9,057,591	888,723	2,349,344	1,994,877	4,344,221	9.87	8.33	18.15
1911 ...	767	2,307,667	2,429,687	10,326,418	1,063,111	2,714.684	2,207,870	4,922,554	10.46	8.51	18.87
1912 ...	837	3,015.987	4.399,022	11,984,452	1,105,362	3.545,225	2,281,743	5,826,968	12.10	7.84	19.86
1913 ...	970	3,570,366	4,995,441	13,659,700	1,388,915	3,815.806	2,534,042	6,349.848	11.49	7.62	19.09
1914 ...	994	3,461,716	4,768,251	14,547,076	1,386.614	3,660,814	2,756,666	6,417,480	10.18	7.66	17.83
1915 ...	1,006	3,544,297	5,040,471	16,394,608	1,656,640	3.961,593	3.356,200	7,317,793	10.81	9.15	19.95

Owing to the economic dullness continued from the previous year, and to damages inflicted upon the railways by floods in summer, the income from passengers and freight decreased little by little until the opening of the Industrial Exhibition and the Imperial coronation stimulated business activities in the autumn of 1915, and this reacting on the railways the final result was an increase of Y.900.313 as against the preceding fiscal year. With regard to the railway account, the total receipts from the railways for the fiscal year 1915 amounted to Y.8,934,430 (including passenger and freight receipts and other sources of income), an increase of 15.5 per cent as compared with the figures for the preceding fiscal year; while the total expenses incurred in operating the railways, including the expenses of the Railway Bureau, amounted to Y.7,155,866 an increase of 10.1 per cent. Thus the net profits of the railways amounted to Y.1,778,564 for the fiscal year under review, showing an increase of 44.3 per cent as against the preceding fiscal year. As to the capital account of the railways, the increase for the fiscal year 1915 was Y.8,004,433. Adding this amount to the capital brought forward from preceding years, the total capital is Y.139,020,584. That is to say the profits on the capital account for the same fiscal year were 6.4 per cent., an increase of 5 per cent upon the preceding fiscal year.

Railway Construction

With the completed construction of the Keijo-Genzan Line, which was effected by August of the year under review, the Peninsula has railway lines aggregating rather over one thousand miles in length, embracing one trunk line starting from Fusan, the nearest port to Japan, and connecting with the Manchuria railway at its terminus on the Chinese frontier, and several branch lines connecting it with important seaports, viz., Jinsen (Chemulpo), Kunsan, Mokpo, Masampo, Chinnampo, and Genzan. As mentioned in the Annual Report for 1913, the laying of a new railway in the northeastern part of the Peninsula, to run through North and South Kankyo provinces by extending the Keijo-Genzan Line as far as the Chinese boundary, is planned, and the total length of this trunk line will measure 373.7 miles, reaching its terminus at Kwainei, with a branch line of 5.3 miles connecting it with the port of Seishin. But the financial condition of the Government-General not being equal to meeting the expenditure involved, it was decided that parts of the railway running through North and South Kankyo provinces, viz., 34.8 miles running from Genzan toward Yeiko and 59.6 miles running from Seishin Harbor toward Kwainei, should be constructed as the first stage, and consent to this was obtained in the 31st Session of the Imperial Diet (1914). The survey of these two sections was completed by July of the year 1914, and work on them was commenced in October. Genzan-Yeiko Section, of which 12.5 miles between Genzan and Bunsen were constructed and opened to traffic in 1915, is expected to be completed within the fiscal year 1916, and Seishin-Kwainei Section within the fiscal year 1917.

The improvement of lines already constructed, such as lessening grades and curves, was steadily carried out as in preceding year.

For railway construction and improvement works, a sum of Y.8,500,000 was apportioned for the fiscal year 1915. The unexpended amount for the previous fiscal year, Y.1,228,869 being added, the total amount allotted for the fiscal year 1915 was Y.9,728,869 of which Y.7,618,076 was actually expended during that year, leaving a balance of Y.2,110,793 of which Y.2,060,000 was deleted on account of the financial retrenchment and Y.50,793 was transferred to the next fiscal year.

Waterworks

Well water in Korean towns is often a cause of epidemic diseases, owing to infiltration from stagnant drains and cesspools. The construction of waterworks in the Peninsula, the people of which are still lacking in general knowledge of sanitary matters, is very important. Urged especially by the necessity of having a supply of good drinking water in the seaports, and in places thickly populated, waterworks have been constructed from 1907 onward, and ten cities and seaports—Keijo, Jinsen, Heijo, Chinnampo, Fusan, Mokpo, Ranan, Kwainei, Kunsan, and Genzan—were in possession of waterworks at the end of the fiscal year 1915. Of these, four were constructed by the Government-General, while the remainder were constructed by Provincial Governments, Urban Prefectures, and School Associations, with the aid of subsidies from the Government-General. The prefecture of Taikyu is also building a waterworks at the expense of Y.415,000 to be defrayed in five consecutive years from 1914, and, of this amount, the subsidy from the Government-General is Y.207,500, while a waterworks at Gishu (Wiju) on a small scale is being constructed at the expense of Y.30,000 of which Y.20,000 is subsidized by the Government-General. Mokpo waterworks at a cost of Y. 235,000 including a subsidy of Y.117,500 was completed in October, 1916.

In addition, the Government encouraged the improvement of existing wells or opened public wells in places as yet unprovided with waterworks.

Keijo Post Office

Keijo is not only the metropolis of the Peninsula and the seat of the Government-General and its affiliated offices, but is a very rapidly growing town, so that its population to-day numbers 176,000 Koreans, 63,000 Japanese, and 2,000 foreigners. The post office built in 1901 to meet the needs of the Japanese settlement not being sufficient for the requirements of the present day, the erection of a permanent brick building was started in October, 1913, and completed in September, 1915, at the cost of Y.240,834.

During the fiscal year 1915 the Government distributed Y.14,798 among the several provinces for the extermination of caterpillars; this was in addition to the sums expended by Provincial Governments out of the Local Levy Funds and to the labor contributed by villagers. Altogether the equivalent of 1,280,000 working days was spent in collecting or destroying caterpillars; the caterpillars and butterflies collected reached 20,800 koku in volume, and the area of forests worked over was over 217,000 cho.

Investigation or survey of State forests in order to decide their status, whether public or private, or if State forests, to discriminate between those needed for preservation and those to be disposed of for private utilization, was commenced in 1911 in certain important localities, with the intention of gradually extending it to the whole Peninsula. In 1915, the surveying parties numbered fifteen and State mountains and forests in all the provinces except North Chusei, and covering an aggregate area of 810,000 cho, were surveyed. If to these be added those surveyed in preceding years, the area aggregates 1,846,000 cho, of which 1,443,000 cho were to be preserved for the State, while it was decided that the remaining 402,000 cho and other unreserved areas should be leased out for utilization as far as possible to individuals and corporations. Several survey parties were also engaged to inspect and survey those forests applied for by individuals or corporations, and the forests receiving such official inspection up to the end of the year under review aggregated 238,048 cho. For these survey works Y.134,537 was defrayed during the year 1915. From the sale of State forests and products Y.72,500 was realized.

In the afforestation work carried out by the Central Government the total area of mountains planted with trees up to the end of the fiscal year under review covered over 2,074 cho, (a cho equals 2.450 acres) and trees planted thereon numbered 6,987,000. In addition 1,835,000 trees were planted on mountains afforested in previous years in order to replace those that died.

Afforestation work has been conducted by Provincial Governments since 1911, and, up to the end of the fiscal year under review, State mountains transferred to Provincial Governments measured 4,704 cho, of which 825 cho was planted with 3,247,000 trees and, in addition, 493,000 trees were planted to replace those that died.

Arbor Day arouses much interest in the people in general, especially in the school children. While 4,650,000 trees were planted on the first arbor day (April 3, 1911), over 10,160,000 trees were planted on the second, 12,430,000 on the third, 13,560,000 on the fourth, and 15,380,000 on the fifth, thus aggregating 56,200,000 trees.

The Oriental Development Company, the Mitsui Firm of Tokyo, and the Seisen Afforestation Company, are also conducting afforestation on a large scale. The total area devoted to afforestation by private individuals and corporations during the past few years is 53,600 cho, the aggregate number of trees planted being 184,150,000.

ENGINEERING, FINANCIAL, AND INDUSTRIAL NEWS

RAILWAYS

Extension of Ssupingkai-Chengchiatun Railway.—The Ssupingkai-Chengchiatun Railway, which has just been completed, leaves very much to be desired as a medium of opening up Eastern Mongolia unless it is extended from Chengchiatun to Kailu, a distance of one hundred and thirty miles. In addition, the construction of a permanent bridge over the Liao to take the place of the temporary wooden one, will have to be put in hand as early as possible. For the proposed extension of the Line to Kailu, Y.1,500,000 is reckoned as sufficient. The span of one hundred and thirty miles intervening is almost level from end to end and there are no broad rivers to be crossed on the way. The construction work is expected to take not more than two years. In order to put the Ssupingkai-Chengchiatun Line on a thoroughly permanent footing, the investment of some Y.2,000,000 is deemed necessary. According to the original understanding, the Yokohama Specie Bank will be offered the first chance to furnish the required funds.

Mukden-Antung Line Cut-Off.—The South Manchuria Railway plans to construct a new ten mile line between Suchiatun on the main line and Chenhsiangtun on the Mukden-Antung Line in the next fiscal year. Surveys will be commenced shortly. At present the Mukden-Antung Line crosses the Fushun Line at Fuan Station and the Main Line at Hunho Station, causing no little inconvenience. It is thought more advisable to make Suchiatun the junction station not only for the Fushun Branch Line, but also for the Mukden-Antung Line. The new line under contemplation is to start at Suchiatun and to proceed eastward along the Shaho River, joining the Mukden-Antung Line at Chenhsiangtun south of Fuan, thereby doing away with the existing section between Hunho and Chenhsiangtun and reducing the mileage of the Mukden-Antung Line by that distance.

South Manchuria Rolling Stock.—The South Manchuria Railway Company has planned to construct eight hundred goods cars and three hundred locomotives as a piece of continuation work extending over the fiscal years of 1918 and 1919. This rolling stock construction program has been further supplemented by the intended construction of three hundred goods cars and one hundred locomotives for the exclusive purpose of transporting coal and materials for the Anshan Steel Works.

It appears that the Company's Management has in mind the inclusion of an appropriation for buying at least six hundred goods cars and a dozen locomotives in the estimates for the next fiscal year. For this purpose will be wanted some Y.6,000,000 at the rate of Y.150,000 per locomotive and Y.7,000 per goods car.

The above estimate is of course subject to variation according to the price of iron and steamer freights and is based upon a plan to buy not materials for construction, but ready-made rolling stock. This is reported to be decidedly cheaper than the purchase of materials. All these purchases are to be made from the United States.

Congestion of Goods in Japan.—Altogether 830,000 tons of goods are now lying at the different stations of the Japanese Imperial Government Railways. Setting aside 320,000 tons of stone and timber and 50,000 tons of stock for the use of the railways, the remaining 460,000 tons include rice, fertilizers, and general merchandise requiring immediate transportation. The Government Railways, with a view to supplementing shortage of goods cars, is pushing forward the construction of hundreds of goods cars at the workshops by offering a bonus of Y.300 a car for speedy completion.

Mukden Tram Car Co.—The horse car tramway connecting the railway station of Mukden with the City carries about 5,000 passengers on an average a day. About one hundred and fifty trips are made daily with thirteen cars with a staff of twenty-seven drivers and as many conductors. Some one hundred and sixty horses are employed. During November, the tramway service carried 157,357 passengers and the fares amounted to S. Y.13,588, being increases by 34,670 passengers and S. Y.3,777.

Tung-pu (Shansi) Railway.—What appears to be the last chapter in the history of the ill-fated Tung-Pu Railway in this province now is being enacted, says a North China Daily News correspondent. The first section of this line, from Yützu, where it connected with the Chêng-Tai line to this city, was nearing completion at the outbreak of the revolution in 1911. Rails had been laid six or seven miles from Yützu. The revolution put a stop to the work and various efforts to revive the enterprise in recent years have proved abortive. Now gangs of men are at work taking up the rails, as the world-wide demand for steel has made them valuable. They are being shipped away eastward as fast as delivered at the Yützu station.

Railway Service in Japan Congested.—The rise in the price of daily necessaries and other articles in Japan in recent years has to a certain extent been attributed to the lack of carrying capacity on the State lines. Upwards of 600,000 tons of goods, including daily necessaries, have accumulated, notwithstanding that the Railway Board has recently increased the number of employees and goods vans. The quantity of goods and the number of passengers carried last year showed an increase of from eight to nine times as compared with the beginning of the Taisho Era in 1912. The condition of the State lines to-day is such that they must ere long be thoroughly repaired. The present narrow gauge system in this country is a disgrace to the Japanese, who think they are a first-class nation, says the "Hochi," which advises the Railway authorities not to raise passenger fares and freight rates but to lower them as far as possible, which was a government pledge on taking over the lines.

Shanghai Tramways.—The following is the traffic return of the Shanghai Tramways (Foreign Settlement) for December, 1917, and for 12 months ended December 31, 1917, with figures for the corresponding periods last year:

	December, 1917	December, 1916
Gross Receipts ...	$135,468.13	$136,880.87
Loss by currency depreciation ...	29,147.93	27,899.46
Effective Receipts Mex.	$106,320.20	$108,981.41
Percentage of loss by currency depreciation... ...	22.80	21.58
Car Miles run ...	330,989	345,231
Passengers carried	6,163,299	6,213,899
	12 Months ended 31st December 1917	12 Months ended 31st December 1916
Gross Receipts ...	$1,613,632.48	$1,537,577.53
Loss by currency depreciation ...	354,775.96	387,509.61
Effective Receipts Mex.	$1,258,856.52	$1,150,067.92
Percentage of loss by currency depreciation... ...	23.26	26.72
Car Miles run ...	4,015,217	3,803,980
Passengers carried	73,461,492	69,089,432

SHIPPING

Japan Bans Ship Sales.—Though the authorities have somewhat relaxed the restrictions on the chartering of Japanese vessels to foreigners, the sale of vessels to foreigners is practically under an embargo. This has led to the suspension of operations at some of the shipbuilding concerns, which sprang up when the shipping market was booming some time ago. In order to relieve the difficulties of these concerns, some shipbuilders are taking steps to get Government permission for the sale of comparatively small vessels to foreigners. It is reported that of late there have arrived quite a number of inquiries from France and Italy regarding vessels of less than 2,000 tons. In view of these offers the shipbuilders and shipping men concerned have arranged for appealing to the Government to allow the alienation of vessels of 1,500 or 1,600 tons. They point out that this would serve the highly desirable purpose of resuscitating the moribund shipbuilders without incurring the loss of large and superior vessels which the Government most fears. At the same time the Government, it is further pointed out, is anxious to contribute to the tonnage at the Allies' disposal, and this desire would be most easily realized if the permission asked for was granted.

Japan's New Naval Program.—The new program calling for Y. 300,548,000 for an expansion of Japan's naval forces, to be completed in six years to come, beginning with the fiscal year 1918-19, was recently explained at the Navy Office. With this appropriation, the navy is to build two battle cruisers of the latest type; three cruisers of the middle size; eleven big destroyers; thirteen smaller destroyers; forty-eight submarines; and six specially commissioned boats. Now that the last expansion program of the navy, which is now in force, being for the realization of the so-called "eight-four" scheme of the navy, the fighting unit of the Japanese navy will become a fleet of eight battleships and six battle cruisers, when the new program is completed in 1923-4.

But the navy is expected not to be contented with the "eight-six" program, but will attempt to enlarge it to the cherished program of "eight-eight" or to have the fighting unit of the navy composed of eight battleships of the latest type and an equal number of the battle cruisers, which is cherished by leaders of the Japanese navy.

Japan Lays Warships, Keels.—The keels for the battleship *Mutsu* and the cruisers *Kuma* and *Tama*, the construction of which was approved at the 39th session of the Imperial Diet, have been laid at the Yokosuka and Sasebo Naval Dockyards and the Mitsubishi Dockyard upon the complete collection of the necessary shipbuilding material. The battleship *Mutsu* is a sister ship to the battleship *Nagato*, now in course of construction at the Kure Naval Dockyard. The cruisers *Kuma* and *Tama* are sister ships of the latest type with a displacement of 5,500 tons each.

Japanese Battleship Delayed.—The construction of the Nagato, a superdreadnaught of the Fuso type, of the Japanese navy, started a few months ago at the Naval Arsenal at Kure, has been stopped for the time being, because of the lack of necessary labor, says a dispatch from Kure to the Tokyo Asahi. The authorities of the arsenal at Kure are consulting with Admiral Shimamura, Chief of the Naval Board of Command, who happened to be visiting there, about this matter, which is regarded as serious for the navy. One reason for lack of labor at the arsenal is because many of the workmen have left the government arsenal to be employed in private factories for better pay.

Kawasaki Dockyard's 40 Per Cent Dividend.—The management of the Kawasaki Company has decided on the following distribution of profits for the last term:

Net profit	Y. 19,051,653
Brought forward	314,007
Total	Y. 19,365,660
To legal reserve	1,910,000
Special reserve	1,500,000
Depreciation fund for buildings and machinery...	2,000,000
Repair fund for buildings and machinery	1,000,000
Coronation commemoration fund for encouraging workers	250,000
Mr. Kawasaki's relief fund for workers	250,000
Fund for extension of business	2,000,000
Employees' life insurance and pension fund	1,500,000
Fund for the dispatch abroad of experts and for experimental purposes	1,500,000
Reserve for equalizing dividends	1,750,000
Dividend, 40 per cent	3,500,000
Bonuses	460,000
Carried forward...	1,745,660

Osaka Shosen Kaisha Dividend 50 Per Cent.—The Osaka Shosen Kaisha will hold a meeting of shareholders January 24, when dividends of 50 per cent per annum will be declared including extraordinary payment of 40 per cent per annum.

New Asano Docks.—Mr. Asano, president of the Asano shipbuilding yard, sent a plan of the proposed Asano shipbuilding dock at Yamauchi-cho, Yokohama, to the government authorities on December 20. According to the plan, all the preliminary arrangements of the new dock will be completed this year and the reclamation of the front shore will be commenced next month. It is expected that the dockyard will be finished by the end of August. Two docks will be built, one will be 700 feet long and the other will be 500 feet long.

FINANCE

Bank of Chosen Broadens Scope.—Hitherto the Yokohama Specie Bank has been monopolizing the privilege of issuing gold notes in Manchuria, under special permit of the Government, says the Yokohama Chamber of Commerce Journal. As this permit expires at the end of the year the Government has decided to cancel the charter, and to empower the Bank of Chosen with the privilege of issuing notes in Manchuria in place of the Specie Bank. An Imperial Ordinance to that effect was issued on November 27, together with a statement by the Finance Department, explaining the change in the system. According to the official statement the Bank of Chosen will act as the Government Treasury in Manchuria and attend to the handling of Treasury funds in that region, and at the same time the Bank will take up the task of effecting the unification of the gold notes in circulation in Manchuria, which notes will be vested with the validity of circulation there and in Mongolia. The Bank of Chosen is by this means made responsible for the task of unifying and regulating the money market in Manchuria, generally with a view to meeting the need of establishing later the gold standard in Manchuria.

Meanwhile the Yokohama Specie Bank is allowed to continue the issue of its silver notes as heretofore, in view of the present currency system in Manchuria. The silver notes issued by the Specie Bank will, however, not be given the absolute right of forced circulation in Kwantung province, but will be made marketable to a proper extent, corresponding to the sphere of the credit that Bank enjoys, this being for the purpose of avoiding any inconvenience likely to occur in actual commercial transactions under the present currency system. At the same time, by the Imperial Ordinance, it has been proclaimed that the notes issued by the Bank of Chosen shall be put in circulation indefinitely in Kwantung province (Liaotung Peninsula) and the South Manchuria Railway concessions, this regulation taking effect on the first of December.

The change has been decided on by the Government in view of the necessity of effecting unity of the currency system and establishing a central monetary organ, and further to establish the basis of the economic development of the Japanese nation. The reason why the Bank of Chosen has been made the agent of the Government Treasury is accounted for by the close economic relations obtaining between Manchuria and Korea and the ever increasing commercial connections between the two districts. As the result of the change, the cashing of the notes hitherto issued by the Yokohama Specie Bank in Manchuria will be attended to by the Bank of Chosen. An arrangement in that connection has been already settled between the two banks, and the Yokohama Specie Bank will concentrate its business in the line of exchange transactions and the offer of monetary facilities for commercial purposes there.

Five Million Loan for Kobe.—Kobe has just made a contract with the Industrial Bank of Japan for the flotation of a loan of Y. 5,000,000 at 6 per cent per annum. The loan will not be offered for subscription but will be taken up by the Industrial Bank of Japan.

Sino-Japanese Exchange Bank.—The organization meeting of the Sino-Japanese Exchange Bank, capitalized at Y.10,000,000, was called to be held toward the end of December. The shares have all been taken up by Japanese financiers. Half of the subscribed capital has been ordered called up.

Japanese November Clearings.—The bills cleared at the Tokyo, Osaka, and nine other clearing houses during November numbered 1,446,179 valued at Y 3,098,187,568. The number of bills averaged 57,847 per day or Y. 123,927,503. Compared with November of last year, the returns show an increase of 138,820 in the number of bills and Y. 786,306,978 in value. The figures for the first eleven months of this year were as follows:

Number of bills, 14,190,876; value, Y. 28,201,235,227; an increase over 1916 in number of bills, 2,219,425; value, Y. 10,615,182,119.

Japan's Postal Savings Increase.—At the end of November, there were 16,693,752 depositors of postal savings, representing Y. 410,085,366, an increase, as compared with the figures for the end of October, of 138,516 in depositors and Y. 4,506,450 in savings. The figures for November show an increase over the same period last year by 1,981,186 in depositors and Y. 117,526,730 in savings.

Japan's Gold Holdings.—Japan's gold holdings stood on December 15, at Y.1,093,000,000, an increase of Y. 18,000,000 over the close of last month. Of this total Y. 372,000,000 goes to the account of the Japanese Government. This figure is an increase of Y. 12,000,000 over the close of last month. According to a financial worker, this increase in the Government gold is due to its taking over the gold held by exchange banks in New York. The share of the Bank of Japan is Y. 720,000,000, which figure is an increase of Y. 6,000,000 over the close of last month. The gold holdings at home are worth Y. 462,000,000. This figure is an increase of Y. 1,000,000. The sum held abroad is estimated at Y. 631,000,000. This last figure is an increase of Y. 17,000,000.

Japan's Communications Receipts.—According to the announcement of the Department of Communications, the receipts for November from the postal, the telephone, and the telegraph services were Y. 6,007,718, an increase of Y. 1,506,615 over the budget estimates for the same period and of Y. 566,366 over the same time of last year. More than half of the present receipts came from the sale of stamps, which amounted to Y. 3,460,980.

Japan's Tobacco Monopoly.—For two reasons,—the rise in the cost of materials and to increase the revenue of the Treasury,—it is announced that the government has raised the prices of various kinds of tobacco prepared by the Monopoly Bureau. The new charges began the first of December, causing a general increase of about twenty per cent in the cost of cigarettes and other forms of tobacco. The prices of materials used by the government factories in preparing tobacco have risen by about sixty per cent, compared with the prices before the outbreak of the war, says the statement issued by the Finance Office. In the current year, however, the government did not suffer greatly from high prices as it had purchased a large stock when prices were low.

In raising the prices of tobacco, however, the authorities concerned considered two points—that the increase in prices should not affect the general returns of the bureau, and that it should not cause suffering to the lower classes. The prices of cheap kinds of tobacco, for instance some cut brands, which are most popular with the lower class people, are left untouched, says the official statement.

From April to the end of September, the aggregate production of Japanese cigarettes reached 5,131,254.000 pieces, an increase of 996,580,000 pieces on the corresponding period of last year. Cut tobacco was sold during the same period to the extent of 384,771 packages, an increase of 24,896 packages. The daily average consumption amounted to 28,040 000 cigarettes and 18,628 packages of cut tobacco, worth Y.259,681. The revenue from the tobacco monopoly for the current fiscal year is expected to be about Y.15.000,000 larger than that for the preceding fiscal year.

Japan's Russian Loans.—As reported in a Reuter message, the Maximalist Government of Russia has announced the repudiation of all foreign loans and interest thereon. Outstanding Japanese loans to the Russian Government are as follows, the figures given being in units of Y.1,000:

Kind	Amount	Interest Per cent	Date of Redemption
5½ per cent	635	5½	Oct., 1925
5½ per cent	4,669	5½	April, 1926
5½ per cent	1,247	5½	Oct., 1926
Treasury Bills...	50,000	6	Feb., 1918
Treasury Bills...	105,000	6	Sept., 1918
Treasury Bills...	66,667	6	Oct., 1918
Total............	228,218		

Of the above amount, Y,50.000,000 represents loans by Japanese private persons, and Y.178,218,000 those by the Japanese Government. In addition, about Y.30,000,000 is due to Japanese merchants and manufacturers on outstanding accounts with the Russian Government in connection with transactions in war supplies. The Japanese Government contemplated issuing Russian Treasury Bills in this country in February next in order to settle those outstanding loans, but this would be impossible, if the Russian repudiation of foreign loans were carried into effect—a procedure not regarded as likely in Japanese financial circles. In any case, Japan's total Russian loans are a little over Y 250.000.000. On this subject the *Mainichi* incidentally adds that that amount is about one sixth of the total net profits which Japan has so far derived from the war, amounting to Y.1.500.000,000.

MINES

Gold Mine Discovered near Kobe.—A clothing merchant at Himeji west of and not far from Kobe, bought an area of wooded hillside comprising about 900,000 tsubo on the boundary of Harima and Tamba provinces. Recently a gold bearing rock was discovered in this area. Samples of the ore were submitted to the Government Mint, Osaka, and the Imperial University, Kyoto, for assaying, and were pronounced as fine gold ore. Offers are being made by the Kuharas, the Mitsubishis, the Fujitas, etc., to buy the area for Y.1,500,000. An expert appraisal estimates the mine to be worth Y.10,000,000.

Coal Problem of Japanese Gas Companies.—With the continued advance in the price of coal, the financial difficulty of gas companies has become much enhanced; some of them having even been forced to wind up their business while others have tried raising their rates or amalgamating with their rivals. Some time ago the gas companies organized a committee and a representation was lodged with the Government requesting that the export of domestic coal be reduced and the sale of Fushun coal overseas prohibited.

The Tokyo Gas Company has a long term contract for fuel and can afford to ignore the problem, but three companies, the Kwansai Gas Company, the Yuki Gas Company, and the Tos n Gas and Electricity Company have suspended their operations. Four other companies, including the Chubi Gas Company, the Inuyama Gas Company, and two other companies, have wound up their business. Some fourteen other companies have combined with companies running other sorts of plants.

Quality of Fushun Coal Upheld.—The estimated consumption of coal in Manchuria for the current fiscal year is 850,000 tons. As matters stand, the coal stock is not so large as in preceding years. None the less the annual increase of coal consumption in Manchuria is put at about 100,000 tons, and stocks are provided for on this basis. The demands from the Chinese Eastern Railway are gauged at 350,000 tons at a conservative figuring, but 150,000 tons are to be sent to meet urgent wants, and it is planned to enrich the stocks along the railway lines.

There have been caustic remarks made about the quality of Fushun coal from the new mines but the coal sales people have given assurances that no coal of inferior quality will be mixed with good coal or be put on the market as good coal.

Mining Applications in Formosa.—The mining applications in Taiwan (Formosa) for October were 225, totaling 1,482 from January to October. Iron, coal, and sulphur are the principal ores.

Steel Company Dividends.—The Nitto Steel Manufacturing Company decided to declare dividends of twenty per cent per annum at the semi-annual meeting held December 22.

The Nippon Steel Tubing Company held an ordinary general meeting of shareholders December 24, when dividends of fifty per cent per annum were declared. The present rate of dividend is an increase of twenty per cent per annum.

Chiksan (Korea) Gold Mines.—The organization of the Chiksan Gold Mines Company by virtue of the Company Ordinance of Korea was officially permitted under date of October 22, says the "Seoul Press." The Company has a capital of three million yen, and will maintain its head office at Chyonan and a branch office at Yokohama.

Plight of Japanese Copper Producers.—There is still no improvement in the Japanese copper market, and the less substantial copper producers are in a difficult position. The boom of a year ago was due exclusively to increased demands from abroad, especially from Russia, and to the activity in munitions manufacture. The latter industry has since greatly shrunk, while the export has almost completely stopped. About a year ago Japanese copper producers contracted to supply the Russian Government with 45,000 tons of copper before April, 1918. They shipped about 20,000 tons in installments, but have suspended further shipments because of delay in payment. No large orders have since arrived in the country either from Russia or any other foreign country. The result is a glut in the market and a consequent decline in prices. There are at present no indications of an improvement in the market, and a further depreciation is considered certain. Though the leading copper miners such as the Mitsubishi, Furukawa, and Sumitomo may not so acutely feel the pinch of the situation, it is said that smaller copper producers find themselves in considerable difficulties.

Japan's Steel Requirements.—According to official investigations, the estimated Japanese demands for steel varieties next year is as follows: Steel in ingots and slabs, 9.900 tons; steel bars and rods, 369,000 tons; steel plates and sheets, 204.800 tons; tinned steel sheets, 7.500 tons; steel galvanized and that coated with base metals, 58.500 tons; rails, 215,0 0 tons; other materials used in railway construction, 14,000 tons; wire, 94.600 tons; pipes and tubes, 69,800 tons; nails, 56,000 tons; steel frames for building and electric poles, 28,000 tons; wire rope and twisted wires, 2,200 tons.

Steel Co. to Use Korean Ore.—The Teikoku Steel Manufacturing Company, just projected by Messrs. D. Kuroita, S. Shibuya, and several other business men and experts, will hold the first general meeting of shareholders early next month, having already called up the payment of the first installment on stock capital. The new company, with a capital of Y.2.000.000, will produce pig iron from ores the company itself works at its own mines in Chosen, Niigata, Tottori, and Gumma, prefectures.

New Korean Iron Mine.—The lately discovered iron mine in Mosan, Korea, is said to have a vein 3 miles long with over 5 strata and covering a wide field. The total amount of ore available is calculated at 200.000.000 tons, the larger part of which is owned by the Mitsubishi Company. The environment of Mosan is topographically rough, so that the development of transportation is difficult, and unless a large outlay of capital was made, ore was not obtainable. With the opening of the Seiskin-Kanei Railway the mines in those parts, which were inaccessible have now come to be competed for. The other firms who have petitioned for license, are the Kuhara and the Suzuki houses.

Korean Coal Mines.—The province of Kanhoku is covered by a vast coal field but it was inferior to the Anshu coal. Hence, outside of a small area, no one attempted to undertake the mining thereof. With the rise of coal prices, however, the natives in northern Chosen have come to mine it, for they can obtain 8 yen a ton in Kainei and 10 yen in Seishin, which is cheaper than the Japanese output. Although it does not possess the heating power of other coals, it is suitable for heating homes. According to experts, if a large output could be obtained and the upper strata disposed of, a better quality of materials will be obtainable. This has attracted large capitalists of Japan, so that many of them have begun to investigate. One mine has been started with the view of exporting to Vladivostok.

INDUSTRIAL

Japan after Manchurian and Mongolian Wool.—Since Great Britain has commandeered all the wool produced in Australia and South Africa, the Tokyo Government has determined to supply Japan's own needs in this line, and has turned to Manchuria and Mongolia and China. The Economical Investigation Bureau has consequently taken up seriously the study of the question and has sent Mr. Kodaira (a Secretary of the Department of Agriculture and Commerce) to visit Inner Mongolia. At the Industrial Experimental Station, Kungchuling, the improvement of the breed of Mongolian sheep has been counted as one of the most important experiments. The sheep in China total something like 20,000,000 head in all, but China herself may adopt a self-supplying policy and in such contingency, Japan will be obliged to look for at least part of her required supply to South Manchuria and Inner Mongolia.

Cotton Crop in Japan and Chosen.—According to official investigations, the area of cotton farms in Japan now amounts to 65,630 acres, producing a crop of 2,427,192 lbs. The localities where cotton is most largely grown are Tottori, Hiroshima, Chiba, Ibaraki, Saitama, and Yamanashi Prefectures. In Chosen, in 1916, the total area of cotton plantations was 188,650 acres, the crop amounting to 5,490,000 lbs. Of the total acreage 71,050 acres are planted with Korean native cotton, producing a crop of 1,695,800 lbs. The Government-General of Chosen plans to enlarge cotton plantations to 245,000 acres and encourage the growing of American upland cotton. In order to protect farmers, the Government-General has fixed standard prices of Korean cotton at a rate higher than Indian cotton, which will make it impracticable to use the Korean cotton in place of Indian cotton.

Japanese Cotton Exchange for Shanghai.—The Japanese Government has granted permission for the opening of an exchange in Shanghai for dealing in securities, raw cotton and cotton yarn. The promoters include prominent business men of Osaka, and the capital will be Y.10,000,000. The Exchange Building will be situated in the International Settlement.

Want More Chinese Cotton for Japan.—A notable feature in the raw cotton trade of Japan is that the import of Chinese cotton is increasing, owing to the growing difficulty felt by buyers of Indian and American cotton, although the stock bought cannot be used in turning out finer yarns and the step taken is only a temporary makeshift. Chinese cotton is not very fine material for yarn producers. Formerly, therefore, most all the stock from China was employed as stuffing, only rarely having been used by the mills in the manufacture of sizes less than 20 counts. But now it is being used much as substitutes for Indian cotton, and its buyers have increased notably. According to the report of the Japanese Cotton Importers' Association this year's import of Chinese cotton, including the pressed, the large, the middle, and the small packages from the beginning of September up to November 20, is estimated at 43,215 bales, which figure is nearly 10 per cent of the whole purchase of raw cotton by Japanese spinners, the total import of raw cotton from various sources during the same period being 450,763 bales.

This year's raw cotton harvest in China has been somewhat adverse and the stock in the market is smaller than last year. Therefore, the increased export to Japan and elsewhere has drained the resources of the Chinese market. Prices for Chinese cotton have increased and in many cases the present ruling prices are double the figures at the same time last year.

Vegetable Wax Trade of Japan.—An industry of Japan which has made remarkable progress in recent years is that of extraction of vegetable wax, which is in demand on foreign markets. The output now stands in the neighborhood of Y.1,700,000, and the work of extraction is being organized on a larger scale. The principal regions of production are in Kyushu, the city of Fukuoka, accounting for nearly half the output. The product is used principally in the manufacture of polishes, pomade and soaps, and in dressing leather. Most of this vegetable wax is derived from the fruit kernels of a tree peculiar to Japan, which begins to fruit at about 15 years, and sometimes bears heavily when it is over 100 years old. It reaches a height of 20 to 25 feet, and produces from 30 to 150 pounds of nuts annually. The best wax is made from nuts that have been kept over the winter, and generally speaking, the quality of the product improves with the age of the nut. The wax is extracted by crushing and steaming the nuts, and then subjecting the mass to pressure. A second wax is secured by repressing. One workman can handle about 150 pounds of raw mass in a day, and this produces about 16 pounds of wax. The crude wax, which solidifies at 50 degrees, is cast into round moulds of a little more than a pound each. It is next refined, the process used being a traditional one and peculiar to Japan. It is mixed with wood or charcoal, ash and water, thoroughly boiled, and dropped into cold water, so as to form what are called wax flowers. These are taken out and exposed to the sun for about 20 days, when the process of boiling, making the flowers, and sunning is repeated. The wax is then boiled a third time, and the best quality taken off the top while it is in a molten condition.

Japan's Porcelain Trade.—During last year the total exports of porcelain from Japan amounted in value to Y.12,400,000, of which Y.6.360,000, or about 50 per cent, represented exports from Kobe and Osaka. The export trade in porcelain last year was quite brisk, expecially in regard to Australia, on account of the suspension of Austro-German products. For a time Japanese porcelain was well received in Australia, and a considerable quantity was exported. The trade has, however, since suffered a setback, owing to the inferior quality of the goods supplied. An abatement of activity is also discernible in the export to the United States, while the recent decline in the value of silver and the difficulties of transportation have led in some cases to the cancellation of Chinese orders. In regard to the South Seas alone the export trade continues active. On the domestic market, conditions are unfavorable and prices have lately declined by about 10 per cent.

South Manchurian Fire Bricks.—Dr. K. Hirano, superintendent of the ceramic division of the South Manchuria Railway's Central Laboratory, has made the following statement regarding fire bricks:

In the manufacture of fire bricks monthly production seldom goes under 1,000 tons, the annual output easily exceeding 10,000 tons. The bricks are principally for the new Anshan Steel Works, and in smaller quantity to the Mitsubishi Steel Works at Kenjiho and the cement factory at Pingpang. There is one special kind of fireproof bricks necessary for the construction of a steel works, which has been obtained from the Government Steel Works at Edamitsu and Shinagawa. The ceramic division has under study several kinds of fire bricks with special properties.

Japanese Rubber Companies.—The South Pacific Rubber Estate Company has just declared dividends of 18 per cent per annum for the past six months, which rate is an increase of 2 per cent per annum over the previous term.

The Borneo Rubber Estate Company has just been organized by many well-known business men here for the purpose of managing rubber estates in North Borneo. Mr. Yokoyama is the president of the new company while Mr J. Urame will undertake the actual management of the company's affairs as Managing Director.

Soap Manufacture at Hongkong.—The increased sale of American soap of all grades in the Hongkong field has been a matter of price and freight space. The increase has been material, and it is likely that a large portion of the new trade will remain with the United States. British soaps are still coming into this field in limited quantities, but the trade is greatly restricted by war conditions. The current high prices for soap supplies have resulted in developing the native soap-making concerns and the prospective development of foreign-style soap factories on a large scale. In addition to the comparatively large soap factory in Hongkong a new one is being established under an American trained soap expert. The concern is backed by ample capital and is importing its machinery from the United States and expects later to operate on a large scale.

The Standard Oil Company of New York is planning to establish modern soap factories in Hongkong, Manila, and Saigon,—cities that come under the control of the Hongkong office of that concern. It is expected that they will be in operation by the close of the current year. There has also been a large increase in small native soap factories. The total output of all these small concerns is considerable, and while the product is poor it has a marked influence upon the soap trade of South China generally. There will continue to be a good demand for higher grades of foreign soap, even at advanced prices, however. Nearly all of the substantial firms in Hongkong interested in the soap trade now have satisfactory American connections and the trade is developing rapidly.

Improving Korean Wool.—Both the Government-General of Chosen and the Government-General of Kwantung have for some time been paying attention to the question and have spent a good sum in crossing the native sheep with the best species from Australia. At the experimental station at Sempo, near Chinnampo, the Governor-General of Chosen keeps a flock of 750 sheep and at the Kungtzeling station, the Governor-General of Kwantung has about 500 sheep. The crossing produces a much better animal than the native. The former yield about five pounds of wool each, while the native sheep gives but two pounds. There is also a great superiority in the quality of the wool. The Japanese Minister of Agriculture and Commerce has sent several experts to Chosen and Munchuria to make further investigations

Many Japanese Industries Prosper.—The Tokyo Electric Company's dividend this term is 20 per cent per annum including extraordinary payments. The Iwaki Portland Cement Company declared dividends of 30 per cent per annum at its semi-annual meeting of shareholders. The Tokyo Calico Weaving Company declared dividends of 16 per cent per annum for the past six months at its semi-annual meeting of shareholders. This rate is an increase of 2 per cent per annum over the previous term. The Tsukijima Machine Manufacturing Company, which has just terminated its first business term, declared dividends of 12 per cent per annum.—The Tokyo Pasteboard Manufacturing Company declared dividends of 24 per cent per annum at the semi-annual meeting of shareholders. The company owes its great prosperity to the sustained boom in the pasteboard market.